

Inside Dope

By GEORGE F. TAUBENECK



Learn to live and laugh —
thus delay your epitaph

Stories of the Week
Gags of the Week
Refrigeration Service
Dilemma
Air Conditioned
Space Explorers
Major Break-through
Late Bulletin
Out of Our Mailbag

Stories of the Week

"Take me to Brigitte Bardot,"
ordered the spaceman as he
climbed out of his flying saucer.
"I'll see your leader later."

Priest preached eloquently on
the values of large families. As
the congregation left the church,
a mother of 11 was overheard
to say:

"I could give a fine sermon
like that too if, like he, I had
no children."

Gags of the Week

How does a woman like to be
treated? Often.

For every man who always
brings home the bacon, there's
a wife who would like sausage
for a change.

Definition of tranquilizer pills:
Instant martinis.

Refrigeration Service Dilemma

Refrigeration serviceman an-
swered an urgent call in Ft.
Wayne, Ind. A tearful bride
met him at the door with this
accusation:

"Three hours ago I baked my
first cake and put it in the
freezer. There isn't any frosting
on it yet!"

Air Conditioned Space Explorers

Earlier this year "Dope" put
together a few paragraphs
about the possibility that outer
space voyagers could be *refrig-*
erated into hypnosis during long
flights—so as to lick the psy-
chological hazards of boredom
and loneliness, and to reduce
food and air intake.

These thoughts were specula-
tive, of course.

Now comes a Yugoslav physi-
ologist, Prof. Jevto M. Radu-
lovic, who suggests that refrig-
eration of space travelers could
serve another purpose—protec-
tion against cosmic radiation.

Research has shown, this pro-
fessor declares, that hypothermy
(cooling of human beings to
(Concluded on Page 15, Col. 1)

Airtemp Plans To Expand All Heating, Cooling

DAYTON — Expansion and
growth of all air conditioning
and heating product lines is the
goal of a "revitalized" Airtemp
Div., Chrysler Corp., Paul M.
Augenstein, newly-appointed
president, declared here recent-
ly.

Answering rumors that Air-
temp would concentrate heavily
on room air conditioners,
Augenstein said:

"Make no mistake. We're
going to get into the room air
conditioner business in a big
way. We have the capability of
being tops in that field, and we
intend to be.

"But room air conditioners
still are only a part of our busi-
ness. We intend to develop and
expand every one of our lines,
residential and commercial,
heating and air conditioning.
We can have no thought of any-
thing but full-line expansion,
based on Airtemp's long tradi-
(Concluded on Page 4, Col. 5)

Drive Ups Sales Of Hydronic Heat

By C. Dale Mericle

NEW YORK CITY — Sharp
gains in the sale of "hydronic"
(hot water) heating systems in
midwestern areas as the result
of local and national promo-
tional efforts were revealed at
the third annual meeting of the
Better Heating-Cooling Council
held at the St. Moritz hotel here
(Concluded on Page 29, Col. 3)

24 Firms Sign To Participate In Certification Program for Unitary Air Conditioning Equipment

Plan Protects Public, Provides Sales Tool

WASHINGTON, D. C. —
Twenty-four of the nation's
leading manufacturers of unitary
air conditioning equipment,
representing more than 75% of
the total U. S. output of such
units, have signed contracts
with Air-Conditioning & Refrig-
eration Institute to participate
in a certification program, ARI
announced.

The program is designed to
guarantee to the public that
unitary equipment bearing the
"seal of certification" complies
with a national standard estab-
lished by ARI. It was developed
by ARI in cooperation with the
National Warm Air Heating &
Air Conditioning Association.

In addition to offering a guar-
antee to the public, the pro-
gram will offer distributors,
dealers, contractors, and build-
ers "one of the most powerful
sales tools they have had in the
history of residential and small
commercial air conditioning,"
according to Coit Lytton, chair-
man of the ARI Unitary Air-
Conditioner Section, which will
administer the program.

"Distributors, dealers, and the
trade generally have in this
seal the guarantee of the in-
tegrity of an industry," Lytton
said. "It will give them, in addi-
tion to the good name of the
manufacturer whose product
they offer, the reputation of two
national trade associations of
manufacturers, backed up by
the results of thorough tests by
an independent testing labora-
tory of the equipment they
sell."

Because of the wide partici-
pation already guaranteed in
the program, plus the likelihood
that a number of other major
manufacturers will sign con-
tracts in the next month or so,
dealers and distributors will
have the choice of a wide
(Concluded on Page 29, Col. 1)

ASHAE-ASRE Merger Vote Result May Be Known on Dec. 1

NEW YORK CITY—It is ex-
pected that the fate of the pro-
posed merger of the American
Society of Refrigerating Engi-
neers, and the American Society
of Heating & Air-Conditioning
Engineers, will be known before
nightfall on Monday, Dec. 1.

Votes that have been cast in
person, or by proxy, will be
counted that day at the semi-
annual meeting of the ASRE at
the Roosevelt hotel in New Or-
leans, and at a special meeting
of the ASHAE at the Conrad
Hilton hotel in Chicago.

Officials of both societies
(Concluded on Page 29, Col. 5)

BEHIND PAGE ONE . . .

RESIDENTIAL Air Conditioning

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Army Says OK, But Private Industry Backs Off on Irradiated Foods

NEW YORK CITY—The problem of producing palatable ir-
radiated foods is being solved by the Army, Maj. Gen. A. T.
McNamara, Quartermaster General, U. S. Army, told the Grocery
Manufacturers of America re-
cently.

However, executives of five
major food companies reported
at GMA's recent convention here
that their firms have discon-
tinued or radically reduced re-
search in the field. They said re-
searchers had been unable to
eliminate a strong odor and
taste from irradiated products
or to overcome other problems.

Gen. McNamara declared the
Army proved early that irradi-
ation of foods was safe, effective,
and practical. The Army dis-
(Concluded on Page 29, Col. 3)

Oldach to Direct Sales of 'Freon'

WILMINGTON, Del. — Dr.
Carl S. Oldach, assistant direc-
tor of du Pont's Development
Dept., has been named director
of sales of the company's
"Freon" Products Div.

He succeeds William A. Bours,
III, who has been appointed
director of sales of du Pont's
Dyes & Chemicals Div. Bours
succeeds Douglas C. Newman
(Concluded on Page 29, Col. 4)

THERMOELECTRIC REFRIGERATION

Catches Nation's Interest

By Frank J. Versagi

Discussions of thermoelectric refrigeration are no
longer restricted to industry circles. Consumer magazines,
business journals, newspapers, even the Jack Paar television
show are carrying news of this new technology and arousing
public interest in its promises. In this issue, the News
brings together a wealth of information on this much-
discussed subject.

Consumer Products In '59?

DETROIT — "Westinghouse,
in 1959, will market a ther-
moelectric appliance; in three
to five years, something ap-
proaching the magnitude of a
household refrigerator will be
offered."

These firm predictions were
made by W. G. Evans, Westing-
house Electric Corp., when he
addressed 80 members and
guests of the Detroit Chapter of
the American Society of Refrig-
erating Engineers recently on
thermoelectric refrigeration.

Evans, who is manager of the
section working on thermoelec-
tric applications, emphasized
that "thermoelectric refrigera-

tion is beyond the 'maybe stage.'
There is no question about its
economic and technical feasi-
bility for military use today—
for domestic and commercial use
soon."

On display at the meeting
were the Westinghouse Hostess
Cart and the Bottle Warmer-
Cooler (see page 8). The
bottle device contains 50 ther-
moelements, and the addition of
more couples would permit it to
pull down to temperature faster,
according to Evans.

It took about an hour for the
device to cool a bottle of soft
drink from room temperature
(Concluded on Page 11, Col. 4)

Russians Selling Refrigerators?

The News has received an
unverified report that the Rus-
sians are offering 8-cu. ft. ther-
moelectric refrigerators for ex-
port sale at \$150-\$180.

Questioned on this report, one
American source stated, "At
this point, this is just a rumor.
If it is true, I would strongly
suspect that these boxes are
water cooled."

NEWS cablegrams to Soviet
sources have as yet brought
neither confirmation nor denial
of this report.

What's It About?

"If you've never seen a Peltier
cell before, look at Fig. 1."

So begins this week's TECH-
NICAL CENTER which pre-
sents for the layman the basic
principles of thermoelectric re-
frigeration.

Theory, applications, specific
answers to practical questions,
predictions—all these are found
in INTRODUCTION TO THER-
MOELECTRIC REFRIGERA-
TION, pages 8 through 12.

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where you're
heading ...
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WORKS: READING, PA.

Cory Disposing of Machinery, Tools, and Inventories for Air Conditioning Output

CHICAGO — Announcing in the annual report to stockholders that Cory Corp. will no longer manufacture Mitchell or Fresh'nd-Aire air conditioners, J. W. Alsdorf, president, said the company is making efforts to dispose of machinery, equipment, tools, and inventories.

He said the firm's withdrawal from the air conditioning business will permit the energies of Cory and subsidiaries to be concentrated on the products it is continuing. Among these are Mitchell and Fresh'nd-Aire dehumidifiers.

Referring to the decision of the company to discontinue the manufacture and sale of air conditioners, Alsdorf told stockholders:

"Air conditioning operations

have not been profitable and manufacture of air conditioners was terminated on June 13, 1958. [Gross sales of these products during the year were approximately \$11,400,000, according to a note to financial statements.]

"Since that date, the company has disposed of substantially all of the finished goods and is now making efforts to dispose of machinery and equipment, tools, inventories, etc..."

Cory and subsidiaries for the fiscal year ended Aug. 31, reported sales of \$24,399,519 and a net loss of \$794,758 after a Federal income tax refund of \$550,000, due to a carry back of loss to prior years.

An operating profit of approximately \$1 million was realized on products other than air conditioners manufactured and sold by the company's various other divisions and subsidiaries.

Figures reported include cost of partial liquidation of the company's air conditioner manufacturing and sales operations which have operated at a loss during recent years.

Alsdorf said the company will continue to manufacture and sell a complete line of Mitchell electric room dehumidifiers and will also continue with the present line of Fresh'nd-Aire fans, heaters, humidifiers, dehumidifiers, and other electric air treatment equipment products.

The company plans to continue to service Mitchell and Fresh'nd-Aire air conditioners previously sold. Consideration is also being given to possible future marketing of additional air treatment appliances under the established Mitchell trade name.

Alsdorf announced that the company's major efforts during 1959 would be directed to aggressive expansion of electric appliance and houseware items presently sold in its Cory, Nicro, and Fresh'nd-Aire divisions.

Alsdorf also reported that during 1958 the company had received a favorable decision in the U. S. District Court on its position that certain air conditioners were not subject to Federal excise tax. A \$2 million reserve has been established to cover the excise tax contingency.

He said that if the present decision is sustained on the government's appeal, it will be possible to restore "a substantial amount" of the contingency reserve to earned surplus.

The contingency reserve for contested income taxes, warranties, and a possible loss on the final liquidation of the company's air conditioner inventories and manufacturing equipment used in its air conditioning operation should be sufficient to cover these contingencies, it was stated.

Due primarily to discontinuance of the air conditioning business, the company, during the year, reduced bank debt from \$7,540,000 to \$3,240,000, inventories from \$8,153,000 to \$4,583,000, and receivables were also considerably reduced, according to the report.

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THERMOBANK COMPRESSOR FOR OUTDOOR USE

WRITE FOR BULLETIN TC-406

KRAMER TRENTON CO. Trenton 5, N. J.

45 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER



Mr. Albert Fogel, President, Howard Refrigerator Co., Inc., Philadelphia, Pa.

"A TRIAL ORDER SHOWED ME THESE SUPERIOR COMPRESSORS DELIVER LONG, TROUBLE-FREE SERVICE"

A provocative statement! It refers to Bendix-Westinghouse condensing units and comes from Albert Fogel, President of Howard Refrigerator Company, with a background of over fifty years' designing and manufacturing experience.

Mr. Fogel adds: "We believe Bendix-Westinghouse engineering is an important reason why our customers are getting the best performing condensing units on the market today. Placing my first order for Bendix-Westinghouse condensing units was a sound decision that I'll never regret. Because they are more dependable and have reduced our

line rejects, we've adopted them as standard equipment on our beverage coolers, reach-ins, dual temperature reach-ins, full vision wall display cases, and a number of other models in our wide line of commercial refrigeration equipment."

There are nearly 200 other new users of Bendix-Westinghouse products who agree with Mr. Fogel—manufacturers who have discovered the extra value you get at no extra cost when you buy Bendix-Westinghouse compressors and condensing units. Maybe you, too, would be wise to send us an order!



Rigid manufacturing and inspection standards have reduced line rejects as much as 75%.

Bendix-Westinghouse

EVANSVILLE, INDIANA

A Division of Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio
Export Sales: Bendix International, 205 E. 42nd St., New York 17, N. Y.

More Math, Fewer Pipe Wrenches, Advises Dean

4 Technologically Trained Men for Every Engineer Is Industry Need, NAPRE Hears

By George M. Hanning

MIAMI BEACH, Fla.—More mathematics and fewer pipe wrenches is what the air conditioning and refrigeration industry needs today, Dean Emeritus W. R. Woolrich of the University of Texas told the National Association of Practical Refrigerating Engineers here recently.

Dean Woolrich said that as vice chairman of the commission on education of the International Institute of Refrigeration, he will soon report in Paris that "at the rapid pace of advancement of American technology in refrigeration and air

conditioning, those who do not grasp the opportunities offered by such agencies as NAPRE for self advancement will lose out in the competitive race indigenous to a free society and a free enterprise system."

Estimating that the industry needs four technologically trained men for every professional engineer, he urged the older, experienced men in the industry to help teach younger members the "know why" as well as the "know how" in refrigeration.

Educating new men, he said, is the greatest contribution

they could make to their association and the nation.

As the industry plans an expansion of several hundred per cent, he declared, men thoroughly educated and trained in the science, operation, and maintenance of machines for producing cold is a national must.

Dean Woolrich also recommended that NAPRE should set up a committee composed of living past presidents to plan for the development of the association over the next 25 years. Such a committee, already tried successfully at the University of Texas, will pay rich dividends, he said.

The association's board has

taken no action on the recommendation yet.

Delegates to NAPRE's 49th annual convention, held at the Hotel Kenilworth here, also heard how Daniel M. Roop, administrative engineer at the Baptist Memorial hospital in Memphis, Tenn. set up a course for hospital engineers.

Guy R. King, vice chairman of NAPRE's educational committee, took some of the mystery out of air conditioning for the practical refrigerating engineer.

A difference of opinion as to whether air in the receiver of an ammonia system affected head pressure developed between Tom Rea of Armstrong Machine Works and Dan Wile of Recold Corp.

Rea contended that air in the receiver does not raise head pressure. It should be removed from the receiver, however, because (1) you have to purge air

where you can get at it, and (2) it can back up into the condenser where it will raise head pressure.

Wile asserted that air in the receiver will raise head pressure and should be purged. He recommended use of a refrigerated purger, which, he explained, will reduce loss of refrigerant to an insignificant amount.

Both men agreed that there was no one best place to purge—either at condenser or receiver, which ever developed the coldest area on the high side.

NAPRE members heard several other speakers talk on drying refrigerant circuits, diesel motors for refrigerated rail cars, electric motor solvents, refrigeration safety, and new product presentations by representatives of Vilter Mfg. Co., Recold Corp., Baltimore Aircoil Co., Armstrong Cork Co., H. A. Phillips & Co., and MMM, Inc.

Roy Burns of Detroit was elected president of NAPRE for the coming year. John Mariakis of Dallas was named first vice president, M. E. Bell of Los Angeles second vice president, S. M. Rambo of Lancaster, Pa., northeastern vice president, Falconer Anderson of Olympia, Wash., northwestern vice president, Quaid Minich of New York City treasurer, Louis W. Howat of New Orleans, sergeant-at-arms, and J. R. Kelahan of Chicago, executive secretary.

Directors are: Leland Kenagy and John Muller of Kansas City, George Paulick of Los Angeles, Eugene Rytlewski of Chicago, C. W. Sullivan of Memphis, Tom Weatherford, Jr. of Dallas, and Frank Chase of New Orleans.

Airtemp Plans--

(Concluded from Page 1, Col. 2) tion of engineering excellence."

Augenstein said that these immediate goals would be expressed frankly to Airtemp field representatives, distributors, and top dealers at the firm's national business conference scheduled here Dec. 4 and 5.

"Improvement of relations between the factory and its dealers and distributors is our prime concern at this meeting," he said. "We intend being perfectly candid in this business conference. Only when everyone understands our plans can we build the confidence and integrity necessary to accomplishment of our objective of increased sales and profits for Airtemp and its dealers and distributors."

Augenstein added that distributors and dealers would hear the firm's plans for improvement of every phase of its business.

"We already are at work revising our pricing and financing policies," he explained. "Product planning, national and local advertising, and sales-service training also will be reorganized more efficiently and profitably."

Predicting record years ahead for residential and commercial heating and air conditioning, Augenstein added that "1959 shows promise of being the start of a new era of growth and expansion in the field."

"Chrysler Airtemp intends to increase its share of sales in this growing field," the new president said.

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Annual ASHAE Meeting In Philadelphia Will Feature 7 Technical Sessions

NEW YORK CITY—Thousands of engineers, contractors, and architects will arrive in Philadelphia on Jan. 26 to attend the 65th annual meeting of the American Society of Heating & Air-Conditioning Engineers at the 14th International Heating & Air Conditioning Exposition under the auspices of ASHAE, according to the society.

Registration headquarters for the meeting will be in the Bellevue-Stratford hotel. The exposition will be in Convention Hall.

Society President E. R. Queer, director and professor of engineering research at Pennsylvania State university, will open the meeting at 9 a.m. on Monday, Jan. 26, when he will call to order the first session.

This is to be a topical session on comfort moderated by C. S. Leopold, Philadelphia member of ASHAE.

The Exposition will officially open at noon on Monday. Exposition hours will be noon to 10 p.m., Monday, Tuesday, and Wednesday, closing at 6:30 p.m. on Thursday, the final day.

The ASHAE Program and Papers Committee, John Everetts, Jr., chairman, Philadelphia, has arranged for seven technical sessions. These include symposiums on hydronics, heat pump performance, and corrosion and water treatment.

Various committee meetings will be held on Saturday and Sunday prior to the official opening of the annual meeting. The ASHAE registration desk at the Bellevue-Stratford will open on Sunday and in the afternoon the Philadelphia Chapter of the society will be host at a Welcome-Pennsylvania Dutch Koffee Klatch.

The topical session on comfort will bring together experts on the subject, including Dr. Thomas Bedford, London School of Hygiene and Tropical Medicine, London, England, Dr. Nello Pace, Dept. of Physiology,

School of Medicine, University of California, and ASHAE Director of Research B. H. Jennings who will present papers concerned with indoor environment and human comfort.

The papers selected for presentation at the meeting are related to residential heating subjects including the location of basement heating supply outlets, pulsations in single-port, gas-fired equipment, and the low frequency combustion noise in oil-burning units.

Other topics are concerned with a new way to calculate radiant exchanges, the heat gain through windows shaded by metal awnings, and a probe for the thermal conductivity

measurement of dry and moist material.

The annual meeting is planned as follows: First session Monday morning; second and third sessions concurrently on Tuesday morning; fourth and fifth sessions simultaneously on Wednesday morning; and sixth and seventh sessions concurrently on Wednesday afternoon.

E. K. Wagner, general chairman of the Philadelphia Chapter Committee on Arrangements, announces that there will be a welcome luncheon on Monday attended by Richardson Dilworth, Mayor of Philadelphia, and a get-together party Monday evening and the annual ASHAE banquet on Wednesday evening.

2 California Proposals Would Affect Engineers

SAN FRANCISCO—Two proposed bills affecting professional engineers are planned for introduction in the California legislative session beginning in January, legislative committee chairman Al Buonaccorsi reported to Golden Gate Chapter, American Society of Heating & Air-Conditioning Engineers recently.

One bill will set up requirements for certification of professional designers, it was explained.

Another bill will offer an amendment to the civil and professional engineers code which will have the effect of prohibiting a corporation or partnership from rendering service unless officers or partners are registered engineers in the branches served.

International Congress Of Refrigeration To Convene August 19-26

COPENHAGEN, Denmark—Tenth International Congress of Refrigeration will convene here Aug. 19 to 26 under the auspices of the International Institute of Refrigeration.

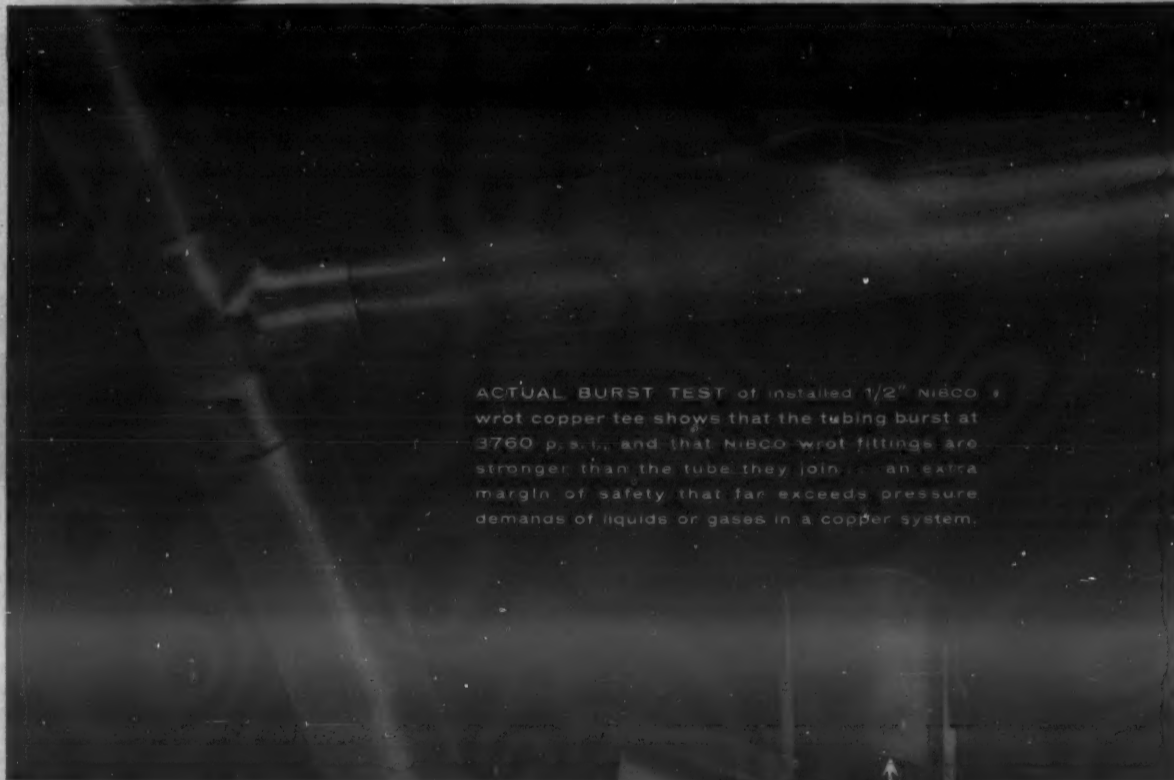
S. Mansted, chairman of the Danish Association of Refrigeration, has issued invitations to all interested in the industry to attend.

Purpose of the Congress is to take stock of the rapid development in science, technique, and applications of refrigeration.

A membership fee and registration fee is required of all who plan to attend. Membership is divided into three classes: donor members, full members, and associate members. Fees are graduated according to the extent of participation in the Congress.



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Peslar, Meadows Named by York

YORK, Pa.—Initiating a plan of operation related to the opening of the new Decatur, Ill. Works of York Div. and redefinition of the York operation, Henry Haase, president and general manager of York Div., Borg-Warner Corp., announced two changes in organization.

Emil Peslar has been made vice president and general works manager of the Grantley Works at York, Pa., and S. S. Meadows was appointed vice president and general manager of the Decatur operations.

The York operation is being located in rehabilitated facilities along Grantley Rd. where divisional headquarters are also established.

Peslar, who was vice president and plant manager of the Marvel-Schelber Products Div. of Borg-Warner at Decatur, will assume administrative responsibility over all production operations at Grantley.

Westinghouse Holding Heat Pump Schools for Distributor, Dealer Personnel

STAUNTON, Va.—The air conditioning division of Westinghouse Electric Corp. recently held the first sessions of a concentrated three-day training school for its franchised heat pump distributor and dealer service personnel at the Staunton plant.

The specialized course is designed to train these students in proper techniques of application, installation, operation, and maintenance of both packaged and remote-type heat pumps.

While basically a product service school, considerable emphasis is placed on related application techniques, including load calculations, equipment selection, cost of operation, and customer education, it was pointed out.

Special equipment setups are provided to simulate year-round heat pump operation. In addition, specialized visual aids are employed to illustrate various components such as the heat pump's four-way transfer valve, the company noted.

The service training facilities at the Westinghouse plant are under the supervision of J. M. Nygaard. Other instructors at the school include a heat pump designer, a field application specialist, and members of the division's general service department.

The heat pump training programs will last for one month, with two classes being given each week. During that time, about 90 students will receive training.

Guy A. Voorhees, Heating Expert, Dies

CLEVELAND—Word was received here that Guy A. Voorhees, one of the outstanding contributors in the advancement of the warm air heating and cooling industry, passed away recently at Methodist hospital in Indianapolis.

Considered as one of the nation's top heating authorities, Voorhees was technical secretary of the National Warm Air Heating & Air Conditioning Association from 1946 until 1958.

During those years, he was the originator and guiding force in the Indoor Comfort Conferences. He taught over 20,000 heating and air conditioning industry members better design and installation practices. Also, he was instrumental in summarizing, interpreting, organizing, and writing the technical manuals of the association.

Joint Industry Program Sub-Committee Submits Findings on Temporary Heat

WASHINGTON, D. C.—Findings and recommendations on revision of the Pittsburgh Agreement on temporary heat to include air conditioning, refrigeration, and all types of heating were made at the second meeting of a sub-committee of the Joint Industry Program Committee which met in the United Association building here.

Leo A. Green of Pittsburgh, second vice president of the UA and chairman of the sub-committee, stated "the sub-committee has been impressed with the importance and magnitude of the entire problem of temporary heat and we have endeavored to the best of our ability all through our deliberations to keep before us the economic

conditions that should prevail in the building and construction industry."

To further this objective, Green declared that this can best be brought about by the thorough dissemination of the findings and recommendations of this sub-committee and the strict enforcement of these findings and recommendations by the local bargaining units of the plumbing and pipe fitting industry.

The findings and recommendations of the sub-committee have been submitted to the JIPC for final approval at its next meeting which will be held in Washington, D. C. on Jan. 9.

In addition to Green, members of the sub-committee attending this meeting were:

Fred A. Schmitz, Redwood City, Calif., NAPC; Frank C. Lawton, Paterson, N. J., MCAA; Byron R. Eplett, Johnstown, Pa., NAPC; Kenneth A. Taylor, Syracuse, N. Y., MCAA; Francis X. McCartin, Chicago, UA; Edward Bertoneau, New Orleans, UA; Paul C. Downey, Milwaukee, MCAA.

Also present were Lloyd B. Gruman, Jr., New York City, MCAA; Jerome O. Hendrickson, Washington, D. C., NAPC; and William C. O'Neill and Martin J. Ward, Washington, D. C., UA.

Beverage-Air Sales, Advertising Switched To Spartanburg, S. C.

PUNXSUTAWNEY, Pa.—Herman L. Buffington, president of The Punxsutawney Co. here, announces the transfer of sales and advertising headquarters for "Beverage-Air" equipment to the Beverage-Air Sales Co., U.S. 29 and S.C. 65, Spartanburg, S. C.

Although operating under the Beverage-Air Sales Co., customer orders will continue to be processed at the Punxsutawney location as well as at the new Spartanburg address, it was stated.

"The Punxsutawney Co. will continue operations as in the past, except for sales and advertising," the announcement said. "Customers are urged to address general sales correspondence to the Spartanburg address. Purchase orders should be mailed to the nearest sales office although orders can and will be processed at either location."

Buffington added that the new factory location in South Carolina was a direct result of wider distribution and increased sales of Beverage-Air equipment. Buffington, who now resides in Spartanburg, is also president of Beverage-Air Sales Co.

A. J. Alsdorf Dies

CHICAGO — A. J. Alsdorf, active in the Chicago export business for 47 years, passed away Nov. 6 in Phoenix, Ariz. He was chairman of the board for The A. J. Alsdorf Corp. of Chicago.

MORE Models
MORE Capacity
MORE Performance



McQuay AIR COOLED CONDENSERS

UP TO 50 TONS IN A SINGLE UNIT—UNLIMITED CAPACITY IN MULTIPLE INSTALLATION

McQuay Aircon remote waterless condenser. Ten models, 3 to 50 ton capacity. Belt or direct drive models. Lifetime ball bearing and slow speed propeller type fans. McQuay Seasonal modulates condenser capacity in accordance with weather for peak performance all year 'round.

WHEN you use McQuay Aircon air cooled condensers you have 10 models to choose from and you get from 3 ton to 50 ton capacity in a single unit! With multiple installations, capacities are unlimited.

You not only get more models and more capacity but you get more performance, because McQuay Aircons have the exclusive McQuay Ripple Fin coils—the finest and the standard of the industry.

With the present emphasis on remote waterless condensers, look to McQuay. Compare construction, compare features, compare the all around quality. Belt or direct drive models are offered. See your McQuay representative or write McQuay, Inc., 1607 Broadway Street N.E., Minneapolis 13, Minnesota.

McQuay
Means Quality



McQuay units feature the exclusive Ripple Fin Coils which create maximum air turbulence and have wide, full fin collars that act as automatic spacers to form a tube around the coil tube for greatest heat transfer and protection.

McQuay INC.



AIR CONDITIONING • HEATING • REFRIGERATION

New Business Publication Announced

AIR ENGINEERING will be the title of a new monthly business publication coming out in April, 1959. It was announced last week by E. L. Henderson, president of Business News Publishing Co., publisher of *Air Conditioning & Refrigeration News*.

AIR ENGINEERING will cover factory and large building air problems, design, installation and maintenance of air conditioning, air moving, and air purification equipment; control and purification of exhaust air; and process air conditioning.

This new industrial publication will be dedicated to human health, comfort, and efficiency in business and industry; to the engineering for air both indoors as well as outdoors.

'WE ARE ENTERING AIR CONDITIONED AGE'

We are entering the air conditioned age. More and more people are learning the advantages, comfort, healthfulness, and the economy of living, working, and riding in an air conditioned atmosphere—heated or cooled, humidified or dehumidified, filtered, cleansed, and properly distributed. We are becoming less tolerant of excessive heat, humidity, and obnoxious odors in our immediate environment.

Alarming, too, we are worried by unhealthy smog covering our cities and cumulative air pollution everywhere.

Furthermore, we are on the threshold of astounding growth in the usefulness of air conditioning for jobs not presently apparent. Factory manager's awareness of the need for air control—for a multiplicity of reasons—is growing. Intricate processes of manufacturing require it; so do productive workers.

Millions will be spent for smoke abatement, odor alleviation, precise temperature and humidity control, and dust removal.

Time will come when practically all contaminated exhaust fumes from engines, furnaces, and industrial processing will be purified to protect the health of people in congested metropolitan areas.

EDITORIAL POLICY DEFINED

AIR ENGINEERING will be devoted to the promotion of better treatment of the air we all breathe. To develop the art of air conditioning in all its ramifications—cooling, heating, humidity control, distribution, purification, and the introduction of aromatic substances into air distribution systems—this new publication will serve future needs of business, industries, municipalities, and the public in general.

Concentration on pure air problems is a new publishing endeavor. All existing business publications presently in this area deal with a multiplicity of subjects in this field, but none encompass or are devoted singly to the increasingly complex problem of AIR.

Air is the most vital tool of life. We can live for weeks without food, days without water, but only minutes without air.

Clean, pure air, that is. To thoughtful scientists, cumulative pollution is a greater threat than radioactive bombs. And to workaday plant managers, architects, and consulting engineers, air movement and control have become pressing matters.

AIR ENGINEERING, thus pioneers a new sphere of publishing usefulness.

AIR ENGINEERING will be edited for consulting engineers, architects, plant and large building maintenance engineers, air conditioning and ventilating contractors and manufacturers. First distribution will go to

10,000 selected engineers and maintenance people and conversion to fully paid circulation will be developed as rapidly as possible.

Advertising rates will start at \$450 per page.

Subscription price will be \$3.00 per year.

AIR ENGINEERING will be published monthly commencing in April, 1959.

Publication of this new magazine alters in no way the policies, plans, and coverage of *Air Conditioning & Refrigeration News* as the weekly newspaper of the air conditioning, heating, and refrigeration industries.

NAPC-MCA Group Sets Merger Study Agenda

WASHINGTON, D. C. — The first joint meeting of the merger study committees of the Mechanical Contractors Association of America and the National Association of Plumbing Contractors was held in Chicago on Nov. 14 at the Palmer House hotel.

The first draft of an agenda of the many major subjects and problems was the basis for discussion. It was decided that each committee would use this agenda for the basis of further study independently; that additional information should also be prepared by each committee; and a second joint meeting be arranged for on Jan. 7 and 8, 1959.

Chrysler Names H. Arthur Wormet

DETROIT—H. Arthur Wormet has been named executive assistant to Charles B. Gorey, Jr., Chrysler Corp. group executive-special products.

The Special Products Group

includes Airtemp, Amplex, Marine and Industrial Engine, and Cycleweld divisions. Wormet had been serving as assistant comptroller in the general sales office.

APPLICATION HINTS:

Ways to simplify construction and cut costs with **Flexpipe**



Flexpipe helps meet tough piping problem in air conditioning an existing building

THE PROBLEM: Air conditioning an existing office building usually calls for a bit of ingenuity in design. One large New York office building decided to air condition by making provision for packaged, water-cooled units to be installed on any floor as tenants required.

This called for four 10-inch risers, running the height of the building, to carry cooling water between the cooling tower and the branch pipes at each floor level. Because of structural conditions, the risers could not be run down through the basements and supported from below. The combined weight of pipes and the water was so great that they could not be anchored at any one point on the structure.

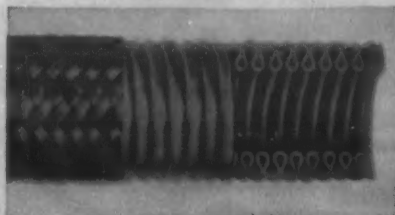
So the consulting engineers, Zimmermann Engineering, New York, floated the risers on spring hangers, distributing the

weight evenly over all floors. This meant, however, that the risers were free to move. A riser full of water weighs several tons more than an empty one and settles about two inches.

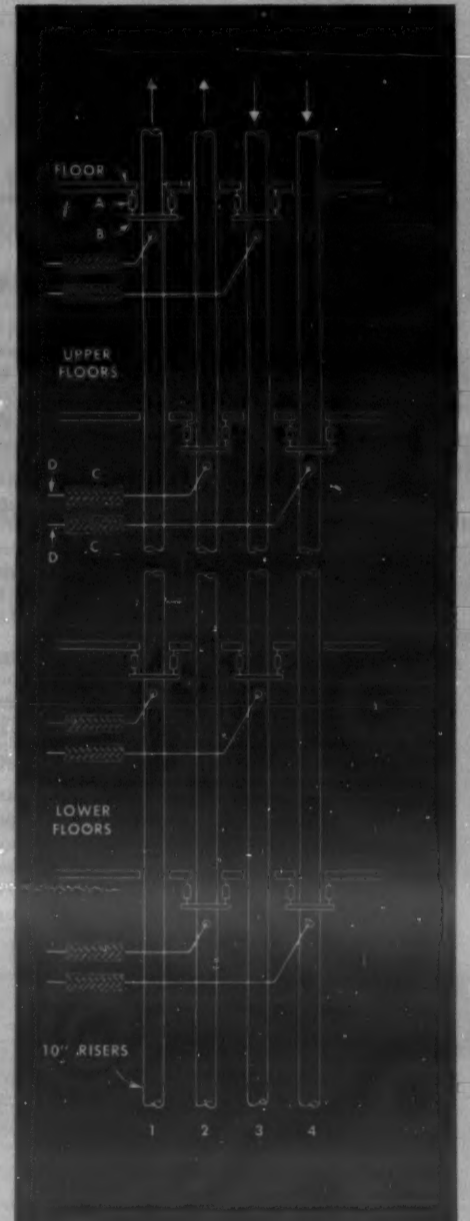
Therefore connections between risers and branch pipes had to be flexible. They also had to have strength, because water pressure at the lower floors approaches 400 psi.

THE SOLUTION: Flexpipe connectors were the answer. They provided the flexibility and the strength required. Furthermore, they were available in the sizes needed—from 5" diameter at the lower floors to 2" at the top floors.

WHERE TO BUY: Flexpipe connectors come in convenient standard sizes and are sold by leading distributors. They can show you samples and answer questions about service applications. For the name and address of the one serving your area, or for more detailed information, write to: The American Brass Company, American Metal Hose Division, Waterbury 20, Conn. In Canada: Anaconda American Brass Limited, New Toronto, Ont.



FLEXPIPE'S flexible core can be either tin bronze, hot dipped galvanized steel or stainless steel. End fittings (attached): flanges, threaded males and welding nipples.



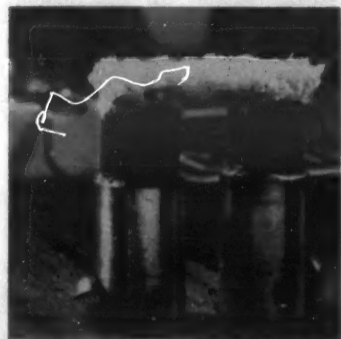
SCHEMATIC DIAGRAM showing how cooling-water risers were installed. A: spring hangers. B: pipe clamps. C: Flexpipes. D: branch pipes at each floor. 1, 2, 3, and 4: risers, 10 inches in diameter. Upper left: Photo of Flexpipe installation at a lower floor.

Flexpipe® an **ANACONDA**® product
made by The American Metal Hose Division
of The American Brass Company

Introduction to Thermoelectric Refrigeration

TECHNICAL CENTER

By Frank J. Versagi, Technical Editor



(Popular Science Photo by R. D. Borst)

FIGURE 1

If you've never seen a Peltier cell before, look at Fig. 1 above.

Illustrated is a single, and simple, thermoelectric cooling device. When this thermoelement, as it is called, is hooked up in series, parallel, or series-parallel with others just like it, you have the makings of a thermoelectric refrigeration system.

As you can see from Figs. 1 and 2, a basic thermoelectric cell consists of two rods of thermoelectric materials—semiconductors, connected by a metal bar, and the arrangement connected to a source of direct current. In the photograph, the black cylinders are semiconductors; they are clamped into large metal contactors; the frost covered bar is copper or any thermal conductor.

If there were just one semiconductor connected to metal contacts, and direct current were passed through it, one end of the semiconductor would become hot, the other end cold. Should the direct current be reversed in direction, the hot end would become cold, the cold end would become hot.

This basic phenomenon is the Peltier effect. That is, when a direct current passes through the junction of two unlike conductors, one junction will heat, the other cool.

Even though the Peltier effect would take place with only one rod, quantitative efficiency is greater when one N-type and one P-type rod are used.

This thermoelectric effect is opposite in N and P-type semiconductors. We can best see this by following operation of a simple cell as in Fig. 2.

Direct current enters the N-type semiconductor as shown by the arrows. The first noticeable effect is a heating at the contact between the metal and the semiconductor.

The current passes through the N-type semiconductor. When it passes through the copper-semiconductor interface, cooling results.

The current passes through the copper bar and through the junction between the copper and the P-type semiconductor. Since the thermoelectric effect is opposite in the P-type than in the N-type, cooling will take place at this junction. Then as the current leaves through the metal contact at the opposite end, heat will be generated.

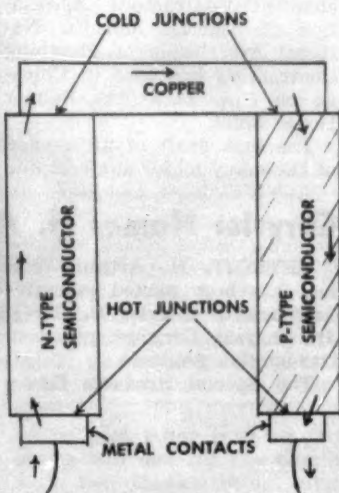


FIGURE 2

This is a key point to understanding the Peltier cell. If the second rod were N-type like the first semiconductor, heat would be generated as the current which has passed through the copper bar entered the second rod, so the effect of cooling at the left junction would be nullified.

Those junctions at which cooling takes place are termed cold junctions; those junctions at which the heat is rejected are called hot junctions.

The entire thermoelectric effect is based on whether the current is going from metal to semiconductor or from semiconductor to metal. To get desired results, therefore, the direction of current and the proper materials must both be considered.

In fact, ignoring all theoretical properties, the practical advantage of these N and P-type semiconductors is that they have this reverse effect which makes it easy to multiply the magnitude of results.

A typical laboratory setup like this just described might have semiconductors about 1 in. long, 1/4 in. diameter. The cool bar might be 2-3 in. Operating at 1-2 volts, this setup would use 5-10 amps. and would give a temperature drop of 36°-54° F. Temperature drop, in this case, is the difference in temperature between the hot and cold junctions.

Most widely known and used semiconductor materials at present are lead and bismuth tellurides.

The Peltier effect is also possible in direct junction between an N and P-type semiconductor, but copper or some other metal is used because of its high thermal conductivity so that cooling a chamber becomes practical.

Thus, in Fig. 3 is seen a sketch of a typical small-volume refrigerated chamber. Heat from the cooled chamber is picked up by the cool copper bar. Cooling vanes are used at the hot junctions to dissipate the heat.

The prototype baby bottle warmer-cooler (Westinghouse) shows the prominent place occupied by cooling vanes in practical applications—Fig. 4.

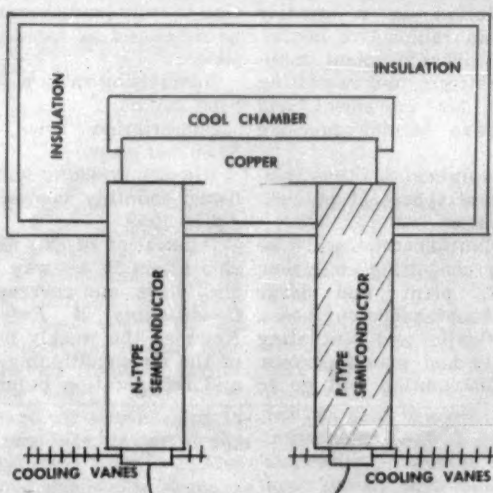


FIGURE 3

In such an appliance, or in such items as the successful Russian thermoelectric refrigerator (Fig. 5), thermoelements are coupled in ways which take into consideration both refrigerating effect and geometry of the unit. High current consumption of these devices also makes mandatory correct engineering of couples; small currents can be handled with series coupling, larger currents can be handled with parallel coupling.

Working against the efficient use of Peltier effect are such things as contact resistance, Thomson effect and Joule effect.

Contact resistance, of course, refers to the resistance to current flow found at all the junctions of metal to semiconductor. The resistance generates heat.

Joule effect is merely the heat due to resistance everywhere in the system. With the high currents which are typical of thermoelectric devices, getting rid of Joule heat becomes a real problem.

Depending on where it takes place, the Thomson effect can be either harmful or helpful. In a sense, the Thomson effect can be considered the same as the Peltier effect except that it takes place within a material, rather than at the junction of two materials. See glossary.

Practical applications of thermoelectric principles thus demand engineering compromises among these several effects—Peltier, Thomson, and Joule.

High Current Used

One of the characteristics of thermoelectric refrigeration is high current consumption at low voltage.

The fairly successful Russian refrigerator, for example, operates at about 150 watts—using 100 amps. at about 1 1/2 volts.

From England comes descriptions of a thermoelectric device using 2,000 amps. at less than 1 volt.

Obvious problem due to this high current consumption is need for extremely large conductor area if excessively high temperatures due to resistance are to be avoided. Problem will be attacked by proper circuiting of thermoelements, as well as by conventional methods like insulation and heat dissipation.

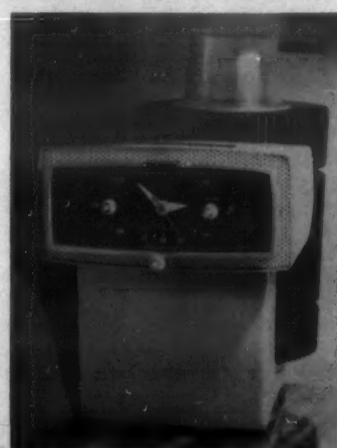
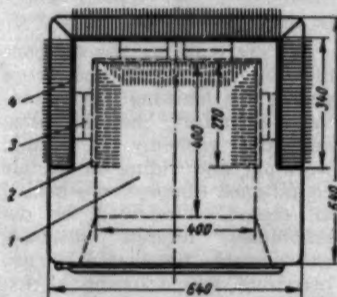


FIGURE 4



Prof. A. F. Ioffe, Russian Authority, Speaks

Prof. A. F. Ioffe, presently director of the Institute for Semiconductors of the USSR Academy of Sciences, is an internationally known solid state physicist who is considered by many to be the world's leading authority on thermoelectric refrigeration.

(See related story, page 12.)

Under Ioffe's direction and impetus, the Russians have admittedly surpassed the world in knowledge of, and limited practical application of, thermoelectric principles—both for power generation and for cooling.

In his book, "Semiconductor Thermoelements and Thermoelectric Cooling," the Soviet

scientist describes some Soviet thermoelectric appliances and presents much of the basic theory of semiconductor materials. In conclusion and prediction, Ioffe makes the following remarks.

"There is no doubt that, for controlling the temperature of small units, thermoelectric cooling has no competition from existing refrigerators of the conventional types.

"When current-quality materials are used in the construction of thermoelements—thermoelectric refrigerators are more economical than absorption units but are as yet inferior to compression units.

"It is, however, well known that the coefficient of performance of a compression refrigerator decreases with the decrease in capacity. Therefore, when it

is necessary to design a refrigerator for cooling a chamber of only a few liters capacity, thermoelectric cooling with the existing thermoelements is already preferable, from the power consumption viewpoint, to cooling with compression units; it also has certain other advantages, such as absence of moving parts, freedom from corrosion, etc.

"We now have at our disposal thermoelements with much better performances and there is every reason to believe that the efficiency of thermoelectric refrigerators will, in the immediate future, exceed that of compression-type refrigerating plants and that the field of application of thermoelectric cooling will become much wider."

More recently, in an article appearing in the November issue

of "Scientific American," Ioffe says, "As yet it is hard to predict what thermoelectric refrigerators for the home will cost when mass produced.

"When it comes to large-scale refrigeration, as in the food industry, the thermoelectric cell does not compete successfully with mechanical systems. We must therefore assume that the applications of thermoelectricity to refrigeration will be restricted to those cases where it is more important to avoid complex machinery than to keep down the amount of electrical energy expended."

Discussing the possibility of using Peltier effect for heating, Ioffe states that the thermoelectric cell can be used as a heat pump to transfer heat from water to a room together with the heat actually supplied by the electrical current.

Heating Also Possible with Peltier Effect

DETROIT—In the enthusiasm over thermoelectric cooling, the opposite effect—heating—is being overlooked a bit, according to Dr. W. Crawford Dunlap, Bendix Aviation Corp. When the direct current is reversed in a simple Peltier cell like that illustrated in Fig. 3, page 8, the chamber becomes an oven.

Per unit of current, more heat is generated than would be produced with conventional resistance heaters—some five or six times more heat.

Conversion of energy into electricity by solar batteries or thermionic generators may combine with thermoelectric phenomena to create hybrid devices.

Semiconductors Not Necessarily Rectifiers

Since Peltier effect refrigeration operates only on direct current, it will be necessary for thermoelectric appliances to have means for converting normal household alternating current to d.c.

The device for accomplishing this conversion is called a rectifier, and the process of converting a.c. to d.c. is called rectification.

A rectifier accomplishes its objective essentially by allowing current to flow through it in only one direction, and not in the other. Thus, alternating current, which travels in both directions, leaves the rectifier as a pulsating direct current.

In discussing thermoelectric refrigeration with non-technical personnel, the NEWS has found some confusion over the terms

Thermoelectric Glossary On Page 12

semiconductor and rectifier. There are those who interpret semiconductor to mean current in one direction only, rather than "about half the conductivity of metals." (See Glossary.)

Some semiconductors, when attached to a metal surface, form a rectifier. Copper oxide is a classic example of this.

However, it is the nature of the contact between the metal and the semiconductor which makes the rectifier; neither material, alone, is a rectifier.

Similarly, the Peltier effect does not occur within a semiconductor, but only at the contact between a semiconductor and a metal or other dissimilar materials. Since only direct current is involved, no rectification takes place under these conditions.

MINERALLAC

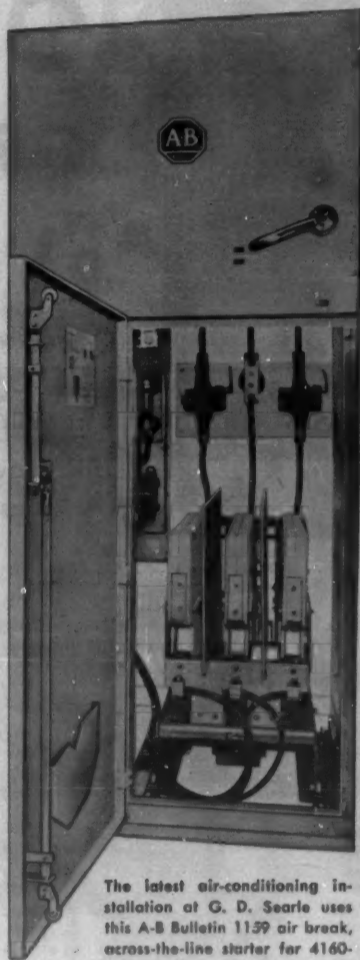


Hangers
Cable and Conduit
... Messenger

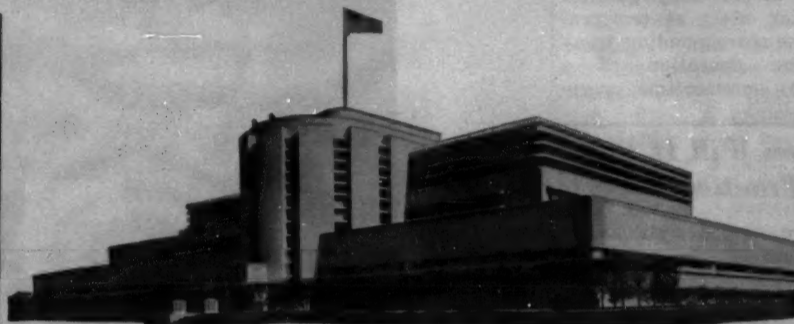
Outserves Outlasts

In Zinc-plated Steel and Everdur. All sizes. Insulating bushings available. Top quality. Permit quick wiring. Send for literature.

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The latest air-conditioning installation at G. D. Searle uses this A-B Bulletin 1159 air break, across-the-line starter for 4160-volt, 200-ton compressor motor.



G. D. Searle & Co. selects ALLEN-BRADLEY AIR BREAK HIGH VOLTAGE STARTERS for its air-conditioning system

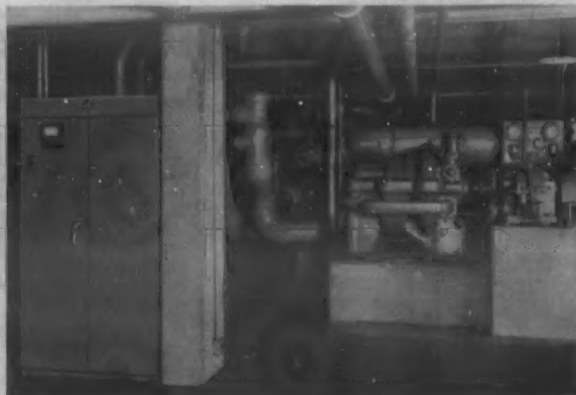
Here's the most modern—and most rugged—high voltage starter built today! Its simple solenoid, air break contactor—with only ONE moving part—virtually guarantees long life and trouble free operation. This same basic design has been used on all Allen-Bradley low voltage starters . . . and is the outstanding reason for their world-wide success and popularity.

Also, using the double break, silver alloy contacts—a standard feature on all A-B motor control—service inspection two or three times a year is all that is necessary. All A-B high voltage starters have permanently accurate thermal overload relays to protect against motor burnouts, and all are equipped with current limiting fuses.

Allen-Bradley high voltage starters are available in a complete line for all types of service—including reversing and plugging—in ratings up to 1500 hp, 2300 v; 2500 hp, 4600 v. For complete information, send for Publication 6080, today.



Here are two Allen-Bradley Bulletin 952 reduced voltage auto-transformer starters operating 4160-volt, 200-ton compressor motors. These starters, using oil-immersed contactors, were put into service



many years ago prior to the introduction of Allen-Bradley's new air break contactor. Oil-immersed starters require more attention but provide good service where frequent starting is not required.



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Laube Questions Answered

ANN ARBOR, Mich. — In a recent letter to the NEWS, Herbert L. Laube, president of Remington Corp., Auburn, N. Y., asked several specific questions about thermoelectric refrigeration.

Commenting on his own questions, Laube added, "My impression is that the efficiency of the Peltier effect is low. Instead of being able to get, say, 8,000 B.t.u. per hour of cooling for an input of one kilowatt, as in the case of a room air conditioner, it would take at least three or four kilowatts to achieve the same results."

Professor Hugh E. Keeler, Dept. of Mechanical Engineering, University of Michigan, has supplied the NEWS with the answers to Laube's specific questions.

Laube: How many B.t.u. per watt are theoretically possible with Peltier effect at temperature ranges corresponding to a) summertime operation of a freezer; b) summertime operation

tion of a household refrigerator; c) normal operation of an air-cooled room air conditioner?

Keeler's Answer: a) 13.51 B.t.u. per watt-hour are theoretically abstracted in the summertime freezer operation, if the following conditions are assumed:

ambient air temperature outside freezer is 90° F., air temperature in freezer is 0° F.,

cold junction surface temperature of thermoelectric cell in freezer is -5° F., hot junction surface temperature is 110° F.

b) Summertime operation of a household refrigerator would allow 19.48 B.t.u. to be abstracted theoretically per watt-hour, if the following conditions are assumed:

ambient air temperature outside refrigerator is 90°, air temperature in refrigerator is 35°,

cold junction surface temperature in refrigerator is 25°, and hot junction surface temperature is 110°.

c) A room air conditioner, operating such that the ambient air to which the hot junctions dissipate heat is at 90°, will theoretically abstract 31.94 B.t.u. per watt-hour. Other conditions will be:

temperature of air leaving air conditioner is 60°,

cold junction surface temperature inside air conditioner is 55°, and hot junction surface temperature is 110°.

In all three examples above, reversed Carnot cycle operation

Amperes	3.0	3.5	4.0	5.0
Volts	7.9	9.0	9.8	11.4
Watts	23.7	31.5	39.2	57.0
B.t.u. per hour refrigerating effect..	25.14	29.74	34.30	32.00
Actual refrigerating effect in				
B.t.u. per watt hour.....	1.06	0.94	0.88	0.56

is assumed. (Editor's Note: see brief discussion of Carnot cycle in glossary, page 12.)

Laube: What actual B.t.u. per watt have laboratories been able to obtain for these three broad applications?

Keeler: Several research laboratories and manufacturing groups have data on the performance of Peltier effect freezers and air conditioners, but the information is not publicly available.

Above is some data on a small Russian designed household refrigerator of about 55 liters (1.94 cu. ft.). Data is taken from German journal "Die Kalte," January, 1957.

Much better results than these have been obtained recently, but the information is not presently available.

Laube: What power factor is to be expected—bearing in mind that alternating current must be converted to direct current in order for the Peltier effect to function?

Keeler: The power factor of the thermocouples is practically 100%; the load is entirely a resistance load.

Rectification of alternating current to direct current may be accomplished by means of silicon rectifiers in a bridge circuit with an efficiency in excess of 99% and a power factor of practically unity.

When Will It Be Practical?

All the recent discussion about thermoelectric refrigeration has led to sharply differing opinions on how close we are to practical application of this long-known phenomenon. The NEWS here offers typical comments on the future of electronic cooling.

"If everything works out as apparently it may, the refrigeration industry could be ripped to pieces."

PROF. HUGH KEELER,
University of Michigan

"When one looks at the many Peltier setups in this country and abroad, it is obvious that we are still in the rudimentary stage as far as actually making these things work on a practical basis."

DR. W. CRAWFORD DUNLAP,
Bendix Aviation Corp.

"When engineers speaking on a subject find it necessary to speak in mathematical equations, they are doing one of three things:

"1) trying to impress their fellow engineers, 2) admitting they have no practical information to present, or 3) trying to hide the fact that they really know very little about the subject."

"When these people start talking about nuts and bolts, we'll know they have something."

Name Withheld

"... when a theoretical principle has been confined by practical laboratory application, it is a pretty sure thing that the arrival of commercially feasible equipment will materialize in time—and in the case of refrigeration and air conditioning equipment, maybe not too long a time. And in the case of refrigerators, maybe we are almost there."

MARK W. CRESAP,
President,
Westinghouse Electric Corp.
(See "Russian Authority Speaks" page 9.)



ONE-STOP GET ALL THESE FROM

ONLY MUELLER
BRASS CO. offers a complete
line of products for every refrigeration
need . . . Available at better
wholesaler's everywhere.

When you buy Mueller Brass Co. Streamline refrigeration products, your purchasing problems are simplified. For, in just one stop, your wholesaler can supply you with all these products which are needed for any commercial refrigeration installation. Mueller Brass Co. refrigeration products are available in the most complete range of styles and sizes in the industry . . . They more than meet the most rigid quality and code requirements.

Drymaster balanced filter driers

"Hi-Fi" filter block desiccant . . . super-fine monal screen filter tube and inlet distributor disc help give Drymaster superb filtering and drying properties. Drymasters are available in six different models with 36 different end connection sizes in flare and solder types. Copper extensions allow the use of either hard or soft solder . . .



MUELLER BRASS

VAMPCO ALUMINUM PRODUCTS, LTD., STRATHROY, ONTARIO



Where Is Peltier Effect Cooling Being Used NOW?

"The immediate prospects are that Peltier effect will be highly practical for specialized applications such as the cooling of small electronic components in a radio or electronic system.

"Further development should hasten the day when water coolers, small refrigerators, and other commercial applications are possible. A breakthrough in materials by an appreciable factor could lead to the obsolescence even of large-scale mechanical refrigerators.

"Such a development is a definite possibility, but it is not likely to occur in the near future."

An accurate evaluation of thermoelectric refrigeration made recently by an industry leader.

Typical of small chamber cooling with Peltier effect is its use in missiles and electronic computers. It is common knowledge that instruments which make use of hundreds of vacuum tubes must be cooled for peak performance. Thus, IBM rooms are always air conditioned. Thermoelectric cooling makes possible the specific cooling of critical tubes or areas within the machine or missile.

There are reports of a highly important component of a missile which uses Peltier effect cooling inside the glass envelope of key vacuum tubes.

Infrared detection cells, used in scientific work, are also cooled in place by built-in thermoelectric cells.

The Russians are reported to

be ready to market a small-volume domestic refrigerator operating on thermoelectric principles.

American companies, so far, have offered novelty items to be looked at, but are not promising anything in the way of consumer products at this time, although there are obvious hints being circulated that "great things are happening."

Radio Corp. of America had an experimental room which was heated and cooled with thermoelectric elements. The room has been dismantled.

RCA, Westinghouse, and Whirlpool have developed experimental refrigerators, as has General Electric. Several companies are developing their own specialized uses for thermoelectric refrigeration.

One example: a unit which maintains an alcohol column at constant temperature for accurate density measurements.

Consumer Goods In '59--

(Concluded from Page 1)

down to 45° F. Power consumption is 60 watts—half of that due to "garden variety transformer, rectifier, and filter used in these prototypes," he said.

After a brief introduction into thermoelectric history and theory, the meeting was devoted to questions submitted by the highly attentive audience.

Q. In a practical ice box, would you need two sets of thermoelements—one for the freezer, another for the regular compartment?

A. The location and design of the thermoelements and radiators determine what freezes and what cools. Fans or liquid heat exchangers can enter the picture. Also, it is possible to use two-stage thermoelements to get freezing and cooling in desired locations.

Q. How would a Peltier refrigerator compare in coefficient of performance with a conventional box?

A. Under normal conditions, a conventional box operates with a COP of 1.5-1.6. Present thermoelectric boxes have a lower COP. These values will be raised.

It is important to remember that in the smaller marketable items, the lower COP will not result in a noticeably larger power bill, so this will not prevent sales of appliances which serve a unique function.

Q. What kinds of loads can thermoelectric cooling handle?

A. Our present devices consume up to 500 watts. We are looking at air conditioning loads of several tons.

Q. Do thermoelements deteriorate in use?

A. Life test data show no deterioration.

Q. Apparently everyone is looking for new materials. What are the properties of an ideal thermoelectric material?

A. First, a maximum Figure of Merit (note, see Glossary, page 12); second, minimum electrical resistance; third, maximum thermal resistance.

When you consider that most good electrical conductors are also good thermal conductors, you can see the uniqueness of what we are after.

Q. How are junctions bonded?

A. By sweat soldering. However, pretreatment of the materials is the key to lowering the contact resistance of the junction. Sophisticated techniques like ultrasonic tinning are used in some cases.

Incidentally, lowering contact resistance is a major consideration in obtaining efficient performance.

Q. Are thermoelectric materials available to anyone?

A. Newer materials under development are secret of course. However, RCA is selling simple couples for \$4 or \$5. These are about 1/2 in. long, 1/4 in. diameter, and they have a Figure of Merit on the order of 0.095.

Q. In your technical discussion, you used a curve which showed a relationship between the Figure of Merit and the number of elements needed to attain a specific temperature. Does this take into account whether the elements are connected in series or parallel?

A. Generally, the number of elements and the Figure of Merit determine the temperature reached regardless of the method of coupling the elements.

Series or parallel coupling does have a bearing, however, on whether you have a low voltage-high current system or a high voltage-low current system.

A practical consideration here is that transforming, rectifying, and filtering household power for thermoelectric devices is relatively costly. It may well prove to be more economical to use a thermoelectric generator which will run off a simple resistance heater and which will supply the low-voltage current needed for thermoelectric devices. (See Seebeck Effect in Glossary.)

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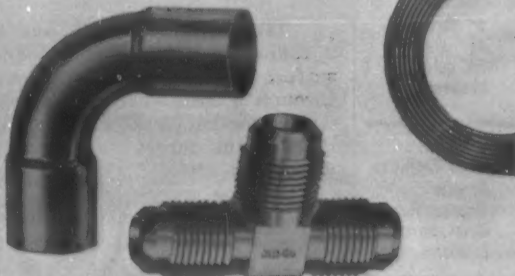
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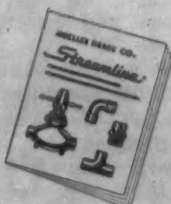
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Semiconductor Expert Visits USSR

Discusses Progress In Thermoelectric Refrigeration

Dr. W. Crawford Dunlap, Jr., supervisor of solid state research at Bendix Aviation Corp., Research Laboratories Div., Detroit, recently visited Dr. A. F. Ioffe, the Russian scientist who is considered by many to be the world's leading authority on thermoelectric refrigeration. Dunlap, an authority on semiconductor materials and theory, lectured on transistor physics, in Russian, at the Institute of Physics in Kiev. His book, "An Introduction to Semiconductors," is currently being translated into Russian.

In this interview, Dr. Dunlap discusses many phases of thermoelectric cooling, both in Russia and in this country.

Q. We hear that the Russians are far ahead of us in thermoelectric products. Are they actually selling Peltier effect refrigerators at the consumer level?

Dunlap: In fall of '57, when I visited Russia, the thermoelectric refrigerator had left the laboratory stage and was in charge of a government ministry which might put it in what we call field development. It is entirely possible that they are just about ready to market the refrigerators.

Another thing to remember is that in the related field of power generation by use of thermoelectric effect the Russians have been marketing appliances for use in rural areas. These appliances may take the heat from a kerosene lamp, for example, and generate enough power to operate a radio or a field telephone.

Q. Did you see the Russian refrigerator? How did it perform?

Dunlap: I actually saw Dr. Ioffe's apartment sized refrigerator. Air fins protruding in the rear indicated it was not a water-cooled box. It reached temperatures just about 32° F., but it wasn't quite able to make ice. It used about 100 amps. at 1-1½ volts; about 150 watts.

Q. How does it happen that the Russians are so far ahead of us in things thermoelectric and on semiconductor materials?

Dunlap: Before I answer that, it is important that you recog-

nize that thermoelectric refrigeration is only one of many phases of work having to do with semiconductors. Transistor physics, for example, is another phase, and in this one the Russians are far behind us.

In thermoelectric phenomena, however, Dr. Ioffe and his group really went deep into the study of hundreds of materials, and they have worked out much of the basic theory of thermoelectric effects. Most American workers readily admit that most of the work they are doing is based on Russian work. One company, which started looking at thermoelectric cooling long ago, did so by trial and error, and its caliber of work was far below that of the Soviets.

Q. What is the general caliber of the Russian scientists you contacted?

Dunlap: I met many scientists at Moscow, Leningrad, and Kiev. In general, I would say their scientists are of very high caliber.

Of course, they have many to choose from. For example, at one institute, there are 10 applicants for every available position. Those not chosen find their ways to lesser positions. Incidentally, within a definite scope, scientists in Russia have considerable freedom of choice and movement.

Q. To leave the Russians and turn to things thermoelectric, what, to your knowledge, has been the lowest temperature ever effected with Peltier effect?

Dunlap: Lowest temperatures so far have been about 70° C. below room temperature or about -50° C. (-58° F.). There have been some published figures indicating a temperature difference between the hot and cold junction of about 100° C., but these are obtained when the hot junction is at a temperature considerably higher than room temperature.

Keep in mind that the actual cooling in degrees is greater if the hot junction is at a higher temperature. Thus, if you had a cell with the hot junction at room temperature, it might give you a 70° C. temperature drop. The same materials, with the hot junction at 100° C. might give a temperature difference of over 100°.

For practical engineering developments, however, it is not wise to think in terms of greater than 20-30° C. cooling right now—36-54° F.

Q. We have a quotation from one enthusiast to the effect that it is theoretically possible to reach absolute zero by use of multiple stage Peltier effect. According to this source, it should not be difficult to get down to ultra-low temperatures.

Dunlap: Theoretically, this statement is true. Practically speaking, people who have looked at these things find that two and three-stage devices are very little better than a single stage.

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AIR CONDITIONING & REFRIGERATION NEWS

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Glossary

The following terms are encountered repeatedly in discussions on thermoelectric refrigeration. Definitions are given with the non-expert in mind. Accompanying articles in this section more fully describe and illustrate terms.

ELECTRONIC REFRIGERATION—another name for thermoelectric refrigeration. Has nothing to do with use of term electronic as in radio and television tubes. Rather is applied because the effects being used are due to motion of electrons in solids—largely independent of mechanical effects.

SEMICONDUCTORS—the basic materials of thermoelectric cooling. These are materials whose electrical conductivity is approximately half way between those of metals, like copper, and insulators, like porcelain or glass. Historic semiconductors are compounds like copper oxide, zinc oxide. Newer materials are ultra-pure silicon or germanium. Their electrical resistance goes down as their temperature goes up.

N-TYPE semiconductor, P-TYPE semiconductor—a distinction between the way materials react to electrical current or heat. Simply, N-type semiconductors are thought of as having negative electrical charges running through them. P-type materials will have positive electrical charges.

PELTIER EFFECT—name given to reversible heating-cooling effect which takes place whenever direct current passes through the contact between dissimilar conductors. Occurs in junctions of two unlike metals, but is more pronounced in contacts between N and P-type semiconductors.

SEEBECK EFFECT—the reverse of Peltier. That is, the conversion of heat into electrical energy. Seebeck effect being used by Russians successfully in power generation for rural areas not supplied by distribution lines. A familiar application: the common thermocouple.

HOT JUNCTION, COLD JUNCTION—when a thermoelectric cell is operating, heat will be absorbed on one contact and rejected on the other. Depending on direction of current flow, junction can be hot or cold.

THOMSON EFFECT—similar to Peltier effect except that it takes place within a conductor, rather than at the contact surface between two conductors. If electric current is passed through a metal bar which has different temperatures within it, one portion of the bar may become warmer, the other cooler. Reverse the current and opposite sections of the bar become warm and cool.

JOULE EFFECT—the same effect which is responsible for operation of an electric range. The heat effect due to resistance of the conducting material.

CARNOT CYCLE—theoretical cycle which defines operation of an ideal heat engine, with reference to use of heat to produce mechanical energy. Refrigeration involves reversing the Carnot cycle, since, in this case, mechanical energy is used to transfer heat from a lower temperature medium to a higher temperature one.

The Carnot cycle applies to all types of refrigeration—centrifugal, reciprocating, absorption, and thermoelectric.

FIGURE OF MERIT—a calculated value which denotes the thermoelectric efficiency of materials. Present materials have Figures of Merit running from about 0.095 to 0.15. Larger Figures of Merit are desired.

Competitively, among the several companies studying and developing thermoelectric cooling, the big secret is what Figures of Merit each has attained with its materials.

I have also seen estimates that nine stages of a Peltier device in a small volume with very low heat loads would be required to cool such a device as an infrared detector cell from room temperature down to liquid nitrogen (-344° F.). This is still a long way from absolute zero—which is approximately -460° F. We might consider the necessity for 50-100 stages based upon present properties to get a truly low temperature system—say liquid helium at -458° F.

Then there are practical problems like geometric placement of stages. Only smaller electrical currents can be run in series; larger currents can be handled in parallel. So for each application, we will have to find the correct combination of series-parallel if we are to avoid cumbersome conductors for carrying the relatively large currents involved.

The Russian refrigerators, for example, have several hundred elements; RCA's electronically air conditioned room has some 8-10,000 elements.

Q. What, in your opinion, does the immediate future hold for us?

Dunlap: For the present, thermoelectric cooling will be limited to gimmicks and specialized uses—usually in very small volumes. For the next five or 10 years, I can foresee no great impetus to the practical application of thermoelectric cooling at the consumer level. This ignores, of course, the always present possibility that some unforeseeable breakthrough will occur.

The Russians carried thermoelectric refrigeration from its basis on a steep growth-of-knowledge curve. The curve has leveled off and we're on a plateau; progress will be steady but slow.

Q. What kind of breakthrough are we looking for? What is the limiting factor in thermoelectric cooling now?

Dunlap: While technology will have a bearing on developments, the major problem is materials—semiconductor materials. To make Peltier effect refrigeration practical for large compartments, for things like air conditioning, we will have to improve present coefficients of performance by a factor of two or three.

To really threaten the industry, we'll have to improve by about a factor of five or 10.

It is entirely possible that somewhere along the line, devices will be developed which make simultaneous use of mechanical and thermoelectric refrigeration.

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Noise Control In Forest Lawn Memorial Park Building Gets 15-Zone System Buildings To Be Conference Topic

WASHINGTON, D. C. — Lighter weight construction, new types of interior partitions, increased use of mechanical equipment in buildings all have given rise to a widespread call by builders and architects for more information about noise control in terms they can understand, according to Charles H. Topping, president of the Building Research Institute, National Academy of Sciences.

BRI has, therefore, scheduled for Jan. 14-15 at the New Yorker hotel, New York City, a research correlation conference on "Noise Control in Buildings" which will examine the various facets of the subject keyed to the needs of architects, builders, engineers, and contractors.

"Prominent in the group of nationally-known experts who will tackle the problem will be Robert B. Newman of Bolt, Beranek & Newman, Inc., one of the country's leading acoustical consulting firms, who will give a physical demonstration of noise control fundamentals to open the two-day meeting.

"Under the chairmanship of John S. Parkinson, manager of building products research for Johns-Manville Corp., a BRI committee has laid out a program which will deal with the comparatively new noise problems encountered in buildings of all kinds due to increased use of lighter weight construction in exterior walls, floors, and interior partitions, and to the use of such mechanical equipment as high velocity air conditioning and ventilating systems, high frequency lighting equipment, air duct terminal devices, communication systems, business machines, etc., in all types of buildings."

The conference will be open to the general public as well as to BRI members and guests. Additional information about the conference may be obtained by writing Harold Horowitz, BRI Technical Secretary, 2101 Constitution Ave., Washington 25, D. C.

Water Treatment Contract Awarded For 34-Story Bldg.

NEW YORK CITY—A contract to treat the water used in the air conditioning system of the new 34-story gold-colored skyscraper at 575 Lexington Ave. to prevent corrosion has been awarded to Water Service Laboratories, Inc., chemical engineer and specialist in water treatment, the firm announced.

The cooling equipment has a capacity of 2,000 tons. The half-million square foot structure was erected by Sam Minskoff & Sons from plans by Sylvan Bien and Robert Bien, architects.

LOS ANGELES—Famed Forest Lawn Memorial Park in Hollywood Hills is 90% complete with an elaborate new air conditioned expansion to its existing central building.

The new brick structure is equal in design and size to the original building it adjoins in the rear. A Colonial architectural theme again predominates.

The new building—three stories plus basement—will utilize only one giant multizone-type central station air conditioner, having 15 separate zone facilities.

The system, specified by the consulting engineering firm, J. L. Hengstler here, is a Drayer-Hanson model FZ-212—one of the largest total of zones yet produced by the West Coast manufacturer.

Factors influencing selection,

at the engineering level, of factory-assembled over a built-up system were stated to be extreme space limitations and a modest budget.

Supply is zoned in accordance with type of occupancy.

Activities in the total project will benefit from year-round air conditioning: The third floor, where extensive casket displays will be maintained for selection; second floor, which will be the Slumber Room section; and first floor, containing general offices and arrangement rooms.

Casket storage and building service functions in the basement will be conditioned, as well.

Design conditions to be met: 95° outside; 75° inside.

The Drayer-Hanson system, room in the basement, was on-

job bolt-assembled from fan, coil, and damper sections. It will be matched with existing—plus new auxiliary—equipment in the old structure.

Piping from the present equipment room is run through present walls to the new air conditioner. Corridors will be used as return air plenums, it was pointed out.

Existing boilers in the old Forest Lawn building are proving adequate to service the new unit.

A new 40-hp. compressor is being positioned alongside the existing 50-hp. unit, to handle the total cooling phase.

An outmoded cooling tower was scrapped for a new Marley, which is being positioned outside the building in an adjacent yard area.

Job credits at Forest Lawn:

Architecture—Walter Montgomery, Architecture Dept., Forest Lawn Memorial Park; general contractor—C. L. Peck Co., L. A.; consulting engineer—J. L. Hengstler, L. A.; air conditioning contractor—United Air Conditioning Corp.; Drayer-Hanson sales agent—Air Conditioning Supply Co., L. A., Gordon Paxson, sales engineer.

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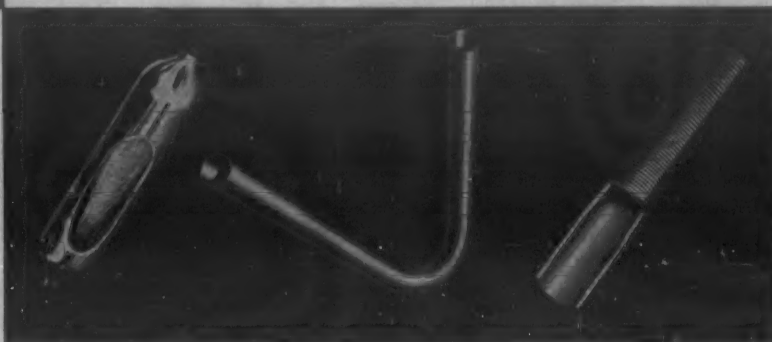
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**SUNSHINE BOWL HAS ELECTRIC HEAT, TOO**

Todd Hyatt Stores
St. Petersburg, Fla.

Editor:

The Oct. 13 issue of AIR CONDITIONING & REFRIGERATION NEWS described the heat pump method of heating at Palisades Lanes, 116th and Halsted, Chicago as a "first" for bowling alleys.

(Editor's Note: The report in the News stated the Palisades Lanes is said to be Chicago's first electrically heated bowling alley.)

Please be advised that Sunshine Bowl, Inc., 6900 Skyway Blvd., St. Petersburg went through our record-breaking winter of 1957-58 with air-cooled heat pumps without the use of any auxiliary heat whatsoever.

Sunshine Bowl, Inc. is one of the most modern with 16 alleys, a snack bar, and complete 100-seat restaurant.

Two 15-ton units are used to handle the alleys and spectators while a 10-ton unit handles the restaurant.

Cooled air is distributed by ducts, with circular diffusers over the spectators and snack bar and rectangular ceiling grilles, one over each lane at the foul line, for the bowlers.

In effect we provided a cold wall just in front of the bowlers and did not attempt to cool the alley space beyond the bowler toward the automatic pin setters.

We have made hundreds of air-cooled heat pump installations ranging in size from 2 tons to 65.

Water-cooled heat pumps here are very unpopular because of the extremely high cost of city water and the high mineral content of well water; 100% of our heat pump installations have been air cooled.

When it gets cold and miserable in Detroit come on down to our Sunshine City and we'll show you some heat pump "firsts."

DEWEY H. DOLISON,
Manager, Commercial Dept.

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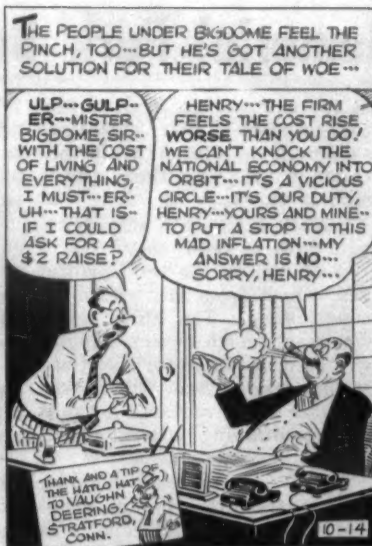
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EVERY BUSINESSMAN in our industry—from manufacturer to dealer, contractor to service firm, wholesaler to consulting engineer—has a stake in workmen's compensation laws.

They comprise highly necessary protection for the employer as well as for the workman; and they are an excellent example of enlightened capitalism in action.

At present workmen's compensation systems are under state jurisdiction, and that's the way they should remain. State laws are based on local employment conditions under which each and every local business must operate.

Employment conditions vary widely geographically in such matters as pay scales, hazards, and resources of employers. The best provision in Pennsylvania might be the worst in Mississippi.

Even so no state law is perfect.

Efforts to improve state legislation in this connection could well start with support for their coverage of atomic radiation hazards. You, Mr. Subscriber, can help alert your state legislature to the need for updating compensation laws, in this connection, through individual and local action.

Presently there's a strong effort going to obtain a federal law covering these

hazards, apparently as a precedent for general intervention in the entire field of workmen's compensation. Hearings on that issue in the next Congress are planned by the Joint Atomic Energy Committee.

Proponents of a Federal law contend that the states aren't acting, and that the Federal government has had more experience in evaluating atomic hazards than state legislatures.

However, the Atomic Energy Commission has offered to supply any legislative body with needed information about the effects of atomic radiation, and how to cope with it.

So far as anybody can see, therefore, no emergency exists which calls for Federal action. Surely the respective states can make necessary changes in their laws in good time.

Thus, it will be to the advantage of businessmen everywhere to work for the improvement and updating of their own state workmen's compensation systems in this regard.

That will help insure their continued freedom from Federal intervention. And the latter, because it obviously would become a political football, should be avoided and checkmated at all costs.

**The Government Says You Can't
Take Care of Your Own Grandparents**

IN OHIO a revolting thing has happened. The Federal government is trying to prevent the Amish people, a Mennonite sect of industrious farmers who mind their own business, from taking care of their own kinfolk.

An auctioneer in Canton, Ohio, recently sold off livestock seized from Amish farmers by the U. S. Government because the Amishmen had refused to pay the Old Age and Survivors Insurance System levies.

That tax, the Amish say, is against their religion. To pay said unwarranted tax is to admit that Washington has a responsibility for their aged relatives. To admit that is to deny one of their own strictest religious precepts.

State records in the two Ohio counties where the U. S. Government seized 28 head of livestock from 15 Amish farmers (plus cash assets of 50 others) show that no

Amishman ever had sought public assistance of any kind at any time. They take care of their own.

You'd think this sort of thing would be praised. Instead, it's penalized.

Amish folk are among the more picturesque inhabitants of the American scene. The men wear beards, the women bonnets; and both wear black clothing without buttons or zippers. They drive old-fashioned horse-and-buggy rigs, and they're old-fashioned in another way, too:

They support themselves, and take care of their needy. They worship God, work hard, and don't cause trouble.

Within memory of many readers of this editorial, theirs was the American Way. What's happened to us, citizens, when we allow such worthy people to be persecuted?

Inside Dope

By GEORGE
F. TAUBENECK

(Concluded from Page 1, Col. 1)

temperatures somewhat below normal) provides protection against many hazards of space flight—including that forbidding dark bank of intense radiation which barriers the Earth from planets like Mars and Venus, and even from the Moon.

In a paper presented to the International Congress on Radiation Research, Prof. Radulovic asserted: "We may presume with certainty that in the coming era of interplanetary flights, hypothermy will play a protective role against harmful cosmic radiation."

The professor didn't say how refrigerated space travelers will get back to normal at the journey's end. Automatic defrosting?

Incidentally, we've read a lot of rather heavy words about how exciting the coming space age is going to be (while pursuing this interesting subject in an attempt to interpret it).

But it does seem to us that sightless, senseless interplanetary travel under hypnotic refrigeration could be dull, especially for one who likes to enjoy the scenery while traveling.

Maybe we'd better not deprecate that refrigerated hypnosis idea, though. It could mean some extra new business for our industry. (As a matter of fact, it already has.)

Major Break-through

Hydraulics engineer Edward Morris has invented a solar device which seems to be a genuine "break-through" in efforts to convert salty seawater into the burgeoning fresh-water needs of man on land.

It's a solar heat device designed to produce fresh water at a reasonable price. Until Morris came along, neither government nor private experiments, conducted all over the world for years and years, really have solved that harrowing cost factor.

Built for a San Diego bottled water concern, a Morris demonstration plant employs 110 reflectors graduated to focus sun heat progressively on a system of water-conveying copper coils. It works—and economically, too!

"Hallelujah!" cry consulting engineers who tinge on the air conditioning business. "Eureka!" cry air conditioning laboratory engineers and market researchers. We simply gotta have more water available to achieve air conditioning's promise.

Inventor Morris attributes

success of his plant to those multiple graduated reflectors—which provide progressive, instead of reductive, heat to the coiled accumulator systems.

This pilot plant produces 60,000 gallons of fresh water every day (provided there are from six to seven hours of sunshine daily). Morris thinks his device also can harness sunshine for industrial power eventually.

What a boon it will be for Australia, the Orient . . . yes, and many U.S.A. cities! And for daring investors!

Late Bulletin

Enhancing the pleasantness of work environment is such an effective means of boosting worker productivity that industry is investing more than \$2 billion in it annually, according to the American Management Association.

Joseph W. Roberts, vice president of Muzak Corp., observes that management this year has spent \$135 million on lighting, \$200 million for sound conditioning, \$15 million for background music, \$7 million for coffee breaks, \$5 million on color engineering and air conditioning, and the rest on decorations and furniture.

Saving money by utilizing psychological influences of happier environment is one of the most exciting and promising challenges facing management.

A saving of \$10,000 a year on "happy worker" plus productivity may equal the net profit on a sales increase of \$200,000, Roberts points out.

In a work force of 1,000 wherein each worker loses only three minutes per hour due to lateness, early departures, idle conversation, "goofing-off," mistakes, etc., there would be a loss

of 13,000 man days per year, or a dollar loss of about \$130,000.

Resulting savings from such boons as air conditioning comprise one of the few means left to management of increasing productivity profits.

"The intelligent use of favorable environmental factors" (air conditioning is most needed) is a clue to higher profits, lower prices, happier workers."

Contractors, please note and quote.

Out of Our Mailbag

Evansville, Indiana

Dear "Dope":

Here are a couple so old that your older readers have forgotten them and your younger ones haven't heard them.

(1) As he waited in the outer office for Big Shot to see him, a salesman said to the gorgeous secretary: "I know

what a stickler for efficiency Mr. B. S. is. You must be an unusually accomplished secretary to hold down this job."

The stunner replied: "As a matter of fact, I don't know the first thing about shorthand, typing, or filing."

"For the love of Pete," responded that salesman, "how do you get away with it?"

The gorgeous gal responded: "I can't conceive."

(2) Gal at a kennel show indicated her admiration of a canine specimen. In reply its owner referred to the animal as a bitch. Gal looked dismayed.

"I'm sorry. Thought you were a dog fancier and accustomed to kennel talk."

"Oh," sez she, "I've often heard the word. Only I never heard it applied to a dog."

LOUIS RUTHENBURG,
(Former President of Copeland, Servel, Nema, Rema, etc.)

NEW CHASE DISPOSABLE REEL PUTS THE FREEZE ON COSTS!



Anheuser-Busch Cabinet Division finds new Chase disposable reel for copper refrigeration tube saves time and materials and cuts costs

Since purchasing Chase copper refrigeration tube on the new Chase disposable reel—on a size especially developed for them—Anheuser-Busch has saved real money on their ice cream cabinet production lines. Here's why:

1. **Increased Production**—long lengths of tube mean fewer set-up and threading operations, decreasing down time.
2. **Scrap Elimination**—losses caused by small cut ends are almost eliminated.
3. **No Kinks or Entanglements**—thanks to the special way the tube is wound on reel.
4. **Inventory Reduction**—no need to carry stocks of varying lengths for various sizes of cabinets.
5. **Work Saved**—new type Chase reels are easy to handle, lighter in weight. No storage problems of empties, no inventory, no returns to keep track of. Just throw them away.

You can get Chase copper refrigeration and air conditioning tube on the new disposable reels in $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{5}{8}$ " OD sizes, lengths from 400 to 3,000 ft. For standard or specially-designed reels, ask your nearest Chase warehouse or District Office—or write Chase at Waterbury 20, Connecticut for full information.

Chase

BRASS & COPPER CO. WATERBURY 20, CONN.
Subsidiary of Kennecott Copper Corporation

The Nation's Headquarters for Aluminum, Brass, Copper and Stainless Steel
Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L.I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury

MARSH Instruments

THE SERVICEMAN LINE of Testing Gauges, Testing Thermometers, Timers, etc.

PRESSURE GAUGES and Dial Thermometers for all services.

MARSH-ELECTRIMATIC, Water Regulating Valves, Solenoid Valves.

MARSH INSTRUMENT COMPANY
Sales Affiliate of J. P. Marsh Corporation
Dept. O, Skokie, Ill.

What Happened to Residential Air Conditioning In Cincinnati In

For five years in a row AIR CONDITIONING & REFRIGERATION NEWS has conducted surveys in various cities to determine exactly what was happening in residential air conditioning.

This year, however, the surveys are much broader in scope, for not only do they reveal the residential cooling picture but they also show what the same contractors are doing in the related fields of residential heating and commercial applications, and tackle such vital questions as the pattern of distribution, methods of advertising, promotion, and sales.

Surveys covering Knoxville and Wichita appeared in the Nov. 10 issue of the NEWS, which was devoted to an analysis of the residential air conditioning market.

By George M. Hanning

CINCINNATI—Hopes for another good season in residential air conditioning were literally chilled out of existence last summer by an uncooperative thermometer. Cincinnati area contractors reported to the NEWS recently.

Collectively their sales had gone up—up—up in 1955, 1956, and 1957. But the rise came to an abrupt halt in 1958. Only one contractor in the baker's dozen sampled by the NEWS said his sales increased—and they represented only an insignificant portion of his total volume.

Existing Home Market Exceeds New Homes

A personal check on 13 Cincinnati area contractors and one distributor indicated that the existing home market continues to produce more sales than the new home market.

It also indicated that, in the new home market, the builder made most of the air conditioning purchases rather than the homeowner as had been the case here in past years.

Since the "season" ended, however, some contractors reported that their business has picked up and they are looking forward to a busier 1959. Others indicated that they are ready to pick up their marbles and devote their efforts to more lucrative fields.

More Data Given By Contractors

This year, the NEWS broadened its look at the residential air conditioning market in Cincinnati. Instead of counting noses to learn only how many residential air conditioners were sold and to whom, it selected a random sample of contractors. It asked these contractors more questions to find out how residential air conditioning fitted into their over-all business.

The 13 contractors and one distributor covered in this survey, the NEWS was given to understand, represented, volumewise, the major portion of contractor-sold residential air conditioning in 1958. The distributor's figures represent residential air conditioning sales through 25 dealers.

Of the 230 units sold this year by contractors covered in the survey, 124—or 54%—were installed in existing homes. This follows the pattern noticed in previous years.

In the new home market, however, a striking change took place. In previous years homeowners were the dominant factor in the purchase of air condi-

tioning. This year, the builder made the purchasing decision involving more than 80% of unit sales.

Comparing the 87 units purchased by builders in this sampling with the 86 units sold in the full-scale survey for 1957, might indicate that the change reflected homeowners withdrawing from the market rather than builders rushing in.

How important to the contractors surveyed was their residential air conditioning business? In no instance did residential cooling account for more than 25% of the contractor's volume. For eight of the 13 firms it amounted to less than 10% of volume.

All of the contractors interviewed were also in the residential heating business, all but one to a considerable extent.

Nine of 13 attained more than half their volume in residential heating.

Others attained a primary

How Cincinnati Residential Contractors Far

(Based on Sales Through Oct. 4)

Contractor	—Residential Cooling—				Residential Heating		Commercial		—Per-
	1958 Total	New Homes Bldr.	Buyer	Exist.	New	Exist.	Cool.	Htg.	Reside Cool.
1	50*	25	....	25	800*	200*	8*	20	10%
2	40*	30	....	10	650†	150†	1	....	2%
3	20*	2	....	18	15†	160†	20†	20	20%
4	15†	10	....	5	450	50	1*	5	5%
5	14*	4	....	10	104	104	6	10	7%
6	12*	8	....	4	35*	15*	25*	....	16%
7	10*	....	....	10	....	6†	40*	10†	6%
8	10*	8	....	2	450	50	2	....	3%
9	7*	....	2	5	2	48	....	15*	15%
10	7*	....	3	4	2*	2*	16*	9†	25%
11	5*	....	....	5	2*	58*	....	....	5%
12	3*	....	....	3	90†	60†	2	4	3%
13	1*	....	....	1	23†	202†	....	5	1%
A\$	36*	....	9	27	1,500*	500*	25†	....	5%
Total	230	87	19	124	4,710	1,605	146	98	.....

*Down from 1957. †Up from 1957. \$Distributor representing 12

*Down from 1957. †Up from 1957. §Distributor representing 25

Acme ...YOUR BEST BUY IN COMPLETE AIR CONDITIONING AND REFRIGERATION SYSTEMS

Look to Acme for the best in all types of air conditioning systems. Acme supplies a complete line of air conditioning and process cooling equipment including packaged liquid chillers, and remote room conditioners, air handlers and multi-zone units for use in direct expansion or chilled water systems. Acme water saving equipment includes evaporative condensers, indoor-outdoor cooling towers and outdoor cooling towers. In addition, Acme offers a complete range of self-contained air conditioners.

Acme components for built-up systems have long been recognized as the best available. All major manufacturers of refrigeration equipment have used Acme components for many years.

Call your Acme sales engineer for details on how he can help you with your air conditioning or process cooling problems.

Acme INDUSTRIES, INC.
JACKSON, MICHIGAN

MANUFACTURERS OF QUALITY AIR CONDITIONING
AND REFRIGERATION EQUIPMENT SINCE 1919

FOR THE BEST IN BUILT-UP SYSTEMS...
USE THESE *Acme* MATCHED COMPONENTS

- Direct Expansion Coolers 1 to 300 tons
- Shell and Tube Condensers 1½ to 700 tons
- Shell and Coil Condensers ¾ to 10 tons
- Heat Exchangers 3 to 150 tons
- Liquid Receivers 3 to 150 tons
- Oil Separators 5 to 100 horsepower
- Air Cooled Condensers 3 to 100 tons
- Direct Expansion, Water and Steam Coils

A complete range of sizes and capacities for almost every
OEM, built-up system and replacement need.

n 1958

Fared In 1958

Percentage of Dollar Volume—				
Residential	Commercial	Other		
Htg.	Cool.	Htg.		
65%	5%	20%		
23%		75%		
50%	15%	15%		
75%		20%		
66%	5%	11%		
24%	35%	25%		
3%	40%	5%		
95%	2%			
70%		15%		
17%	25%	25%		
55%		40%		
71%	1%	25%		
98%		1%		
90%	5%			

g 25 dealers.

share of their volume from building supplies, commercial refrigeration, refrigeration service, and commercial cooling and heating.

Three of the contractors sold no commercial air conditioning and four sold no commercial heating. Commercial air conditioning played an important part in the businesses of only three contractors and commercial heating was second largest volume produce for three.

Of those contractors interviewed, seven (slightly more than half) sold only a single brand of residential air conditioner. Two sold two brands and three sold three brands. One contractor sold six makes.

Three of the top five volume producers in residential air conditioning sold only a single brand of equipment. On the other hand, the three bottom contractors in the survey also sold only a single brand.

In residential heating, six of the contractors and the distributor made the bulk of their sales to new homes. Three contractors sold mostly to existing homes and one sold only to existing homes. Two split their sales evenly between these two markets.

The great bulk of heating equipment sold was forced warm air. One contractor and the distributor sold some gravity furnaces.

Of the units sold, 91% were forced air or gravity furnaces. Eight per cent were hot water systems. Two units were steam and one a floor furnace.

Residential heating brands handled ranged from one to five. Only three contractors sold a single line of heating equipment. Five sold two brands, three sold three brands, one sold four brands, and one five.

In commercial air conditioning, only one contractor sold a

chilled water unit. All the remainder were direct expansion systems. One hundred twelve units were air cooled and 34 were water cooled.

For commercial heating applications, 55% of their sales were hot water units, 30% forced warm air, and 15% steam.

All but two of the contractors interviewed maintained stocks of the residential air conditioning equipment they sold. Some said it was not a large amount for the volume they did.

Others ruefully commented that they had too large stocks for the volume they did.

Asked from whom they purchased their equipment—independent wholesaler, franchised distributor, or direct from manufacturer—most bought a large share of their equipment direct.

Nine of the contractors bought at least some of their residential air conditioning

equipment from franchised distributors.

Eight bought their residential heating equipment direct from manufacturer, five from a franchised distributor, and four from an independent wholesaler.

Of the 10 contractors selling commercial air conditioning equipment, seven bought direct from manufacturer, five from a franchised distributor, and only one from an independent wholesaler.

Of nine contractors doing commercial heating, six bought direct from manufacturer, three from a franchised distributor, and three from independent wholesalers.

Where Firms Placed Their Advertising

Beyond the telephone book, which nearly all the contractors used, most did very little advertising, if any at all, on residential air conditioning this year.

Six used newspaper advertising. No. 2 contractor promoted through food and home shows and telephone solicitations. No. 3 employed radio and television as well as newspaper advertising.

Another tried institutional publications, such as that put out by the automobile club. One used direct mail, one canvassing, and one a neighborhood directory.

Biggest source of sales, however, came from personal contact by the contractor or his salesman. User referrals produce a good many sales. Dodge Reports are also helpful for commercial jobs.

One distributor—not the one whose sales are recorded in the accompanying chart—reported that his company inserted several thousand lines of advertising on residential air conditioning in one month early last summer.

"It didn't pull a single inquiry," he noted.

He commented that he sold more air conditioning in September—and that was little enough—than he did during the cooling season.

"Where we aren't putting in air conditioning, we are putting in the housings," he added. "The interest is there."

"We're prepared for 1959," he smiled. "We've got the equipment already."

A contractor echoed his opinion that while business was very slow this summer it has picked up since then. "Prospects look real good for the coming year," he said.

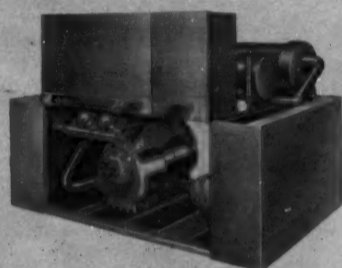
Some Contractors Disgusted With Business

Another contractor who also found himself at season's end with a warehouse full of furnaces and air conditioners, took a dim view of the future. "We're disgusted with the air conditioning and heating business," he glummed.

Equally disgusted was a contractor who affirmed, "we're not planning to do anything with air conditioning next year." His reason: "Nobody ever made a nickel out of air conditioning except maybe the manufacturers."

Another contractor admitted that he had never really tried to sell residential air conditioning because "there's no money in it."

CHILLED WATER SYSTEMS



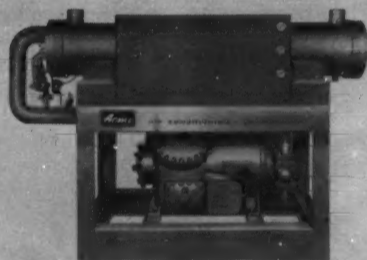
Flow Cold packaged water chillers—3 through 30 tons



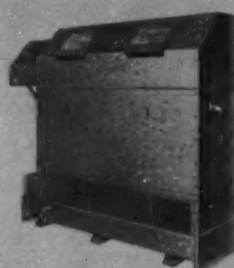
Flow Cold cooling towers—3 through 20 tons



Remote room conditioners—4 types in 16 models from 200-600 cfm



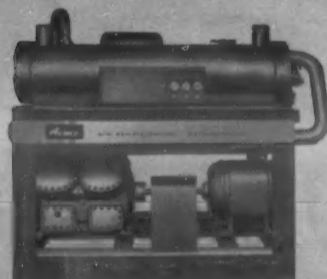
Model HE Flow Therm packaged water chillers—20 through 60 tons



Flow Mizer cooling towers—20 through 175 tons



Air handlers—4 types in 40 models from 665 to 19,200 cfm



Model DE Flow Therm packaged water chillers—20 through 125 tons



Flow Mizer evaporative condensers—Capacities to 200 tons



Multi-zone air conditioners—5 models from 4,060 to 19,200 cfm

SELF CONTAINED SYSTEMS



Self contained packaged air conditioners—5 models from 3 to 15 tons, air or water cooled



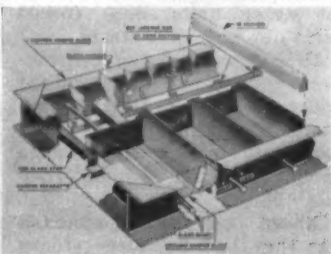
Self contained packaged air conditioners—24 models from 20 to 60 tons, air or water cooled

FOR MORE INFORMATION ON THE PRODUCTS DESCRIBED ON THIS PAGE
Write Directly to the Company—at the Address Given in the News Item

Redesigned Flexazone Line Offers Improvements Duct Insulation Meets 'Fireproof' Needs

"Flexazone" central-station air conditioners (for independent/variable zone control) are now being factory readied with major redesign improvements of damper section, it was announced by Drayer-Hanson, Div. of National-U. S. Radiator Corp., Dept. AC&RN, 3301 Medford St., Los Angeles 63, Calif.

End result is stated to be an even more positive, sensitive control, reduction of outlet velocity air noise, a lower zone outlet velocity, since no blades are removed to provide space for a zone divider, damper action in the redesign which incorporates all the features of opposed blade action, since throttling of the air is proportionate throughout the range from full open to full closed and blade dividers act as straightening vanes for air flow.



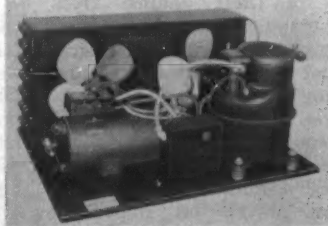
Also, the company said, improved, more flexible design eliminates crank arms for each rod... adds a divider blade between each damper blade, affording a simplified means of changing zone sizes in the field. In addition, each model in nine-model FZ line will be available in 32 different zone arrangements, according to the manufacturer.

An incombustible, foil-faced spun mineral wool duct insulation is announced by Industrial Insulation Div., Baldwin-Hill Co., Dept. AC&RN, Trenton, N. J.

The new material is designed specifically to provide a vapor barrier meeting "fireproof" building requirements and also to present an attractive finished appearance on exposed ducts without special, extra finishing steps.

The insulation is faced on one side with embossed aluminum foil .0025-in. thick. The foil facing acts as a vapor barrier where condensation is a problem in the insulation of heating and air conditioning ducts, the company said.

The new insulation comes in 24 by 48-in. semi-rigid sheets, 1, 1½, and 2-in. thick.



Bendix-Westinghouse Offers 2 New Models

Two new models of high temperature condensing units in the 1½-hp. size were recently released by Evansville Div., Bendix-Westinghouse Automotive Air Brake Co., Dept. AC&RN, 950 East Virginia St., Evansville 11, Ind.

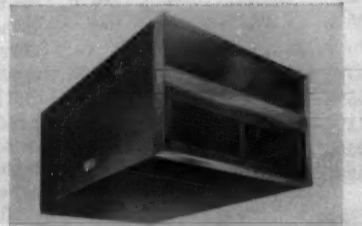
These units are designed to operate efficiently in high ambient temperatures such as are often encountered on bulk milk cooler applications, the company stated.

The units are counterparts to the present R-22 models for manufacturers who prefer R-12.

Gasket Needs No Back Pan Removal

A neoprene gasket that can be quickly and easily applied to stainless steel and porcelain refrigerator doors without removing the back pan is manufactured by Chase Industrial Refrigerator Equipment & Engineering Co., Dept. AC&RN, 630 Reading Rd., Reading, Ohio.

The gray gasketing material is available in ¾ in. and ½ in. thicknesses and in 250-ft. continuous rolls.



Typhoon Units Can Be Used on Ceiling, Wall

Air conditioning air handling units in 3, 5, 8, 10, and 15-ton capacities designed with an improved "free-throw" plenum chamber and with a simply installed heating coil accessory, have been introduced by Typhoon Air Conditioning Co., Div. of Hipp Corp., Dept. AC&RN, 505 Carroll St., Brooklyn 15.

Part of Typhoon's 1959 line, the units may be suspended from the ceiling or recessed into the wall. They are designed for "free throw" or ductwork installation, and may be used with water cooled or air-cooled air conditioning, or as parts of chilled water systems.

B.t.u.h. cooling capacity of the units is 37,000 for the 3-ton model, 60,600 for the 5-ton, 97,500 for the 8-ton, 125,000 for the 10-ton, and 191,000 for the 15-ton model, according to the company.

Capacity of the heating coils is 108,000 for the 3-ton model, 181,000 for the 5-ton, 250,000 for the 8-ton, 330,000 for the 10-ton, and 500,000 for the 15-ton model.

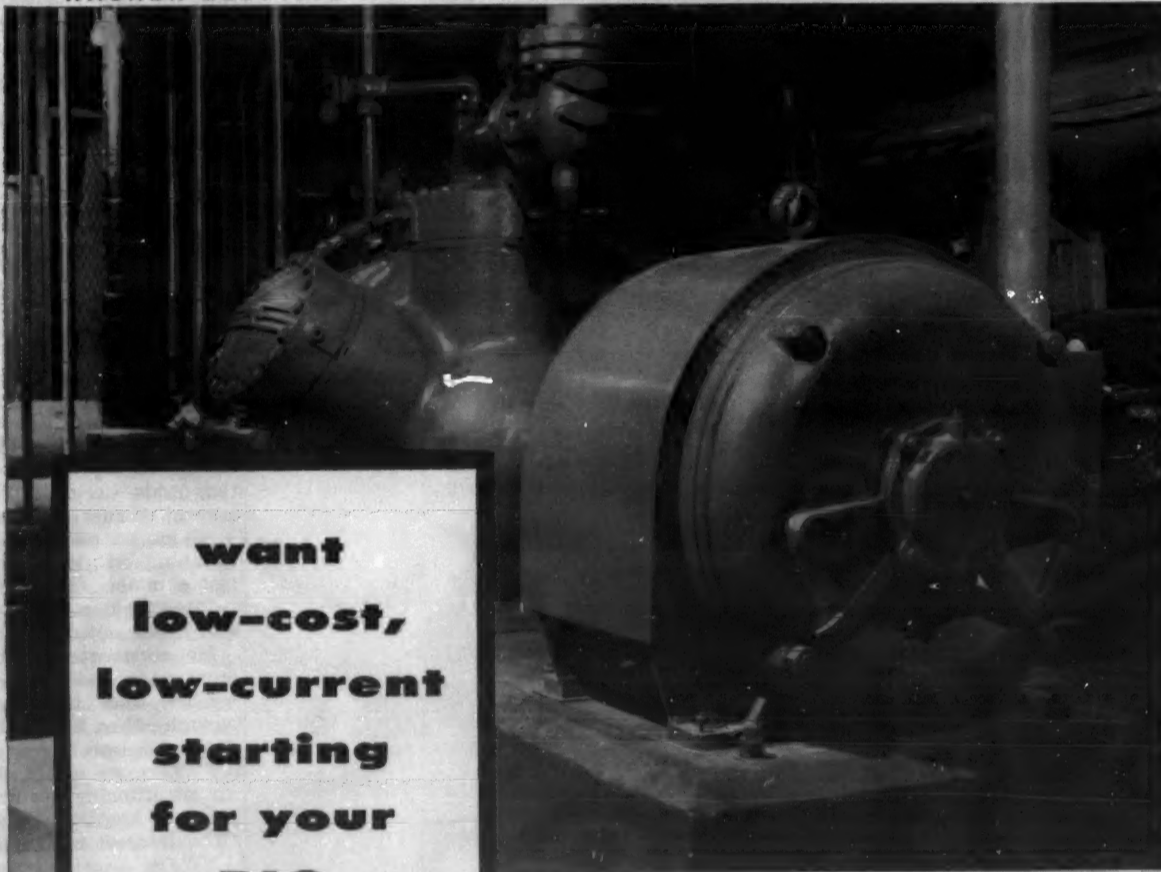
Temco Redesigns 2 'Pre-Vent' Models

Two completely redesigned models of its "Pre-Vent" sealed combustion gas wall heater are offered by Temco, Inc., Dept. AC&RN, Nashville, Tenn.

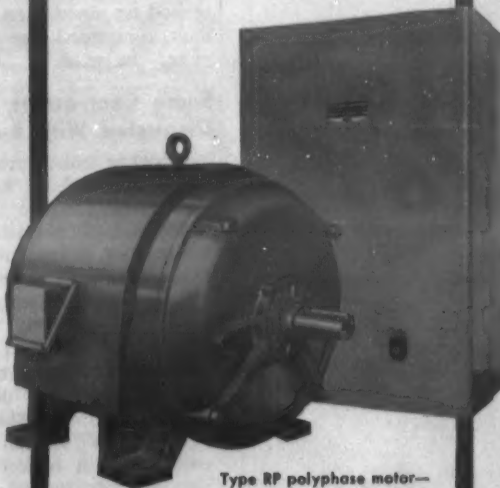
Finished in a neutral tan silicone paint, the new units feature an exposed, "out front" temperature control knob and will be available in both 20,000 and 30,000 B.t.u. capacities, according to the announcement.

"The pre-engineered vent does away with major installation costs as it does not require a chimney or flue," the company said. "The through-the-wall vent functions in the same fashion as the snorkel on modern submarines, drawing fresh air in from the outside and exhausting products of combustion to the outside. Room air is completely sealed off from the flame by Temco's 'Ceramiclad' heat exchanger; there is no loss of oxygen from the room."

WAGNER ELECTRIC MOTORS...THE CHOICE OF LEADERS IN INDUSTRY



**want
low-cost,
low-current
starting
for your
BIG
MOTORS?**



Type RP polyphase motor—in ratings to 500 hp. with increment type starter.

Specify Wagner Increment Motor-Starter Combinations.

Part-winding starting is the simple, inexpensive way to limit the inrush of starting current in squirrel-cage motors up to 500 horsepower—and only the Wagner Increment Motor-Starter Combination gives you all these advantages:

LOW FIRST COST—Uses a standard Wagner Motor and a part-winding starter—no need for auto-transformers or resistors.

EASE OF INSTALLATION—Starter is compact and relatively light in weight, connections are simple and easy to make.

MINIMUM MAINTENANCE—The Wagner Motor requires only regular inspection, cleaning and lubrication—the starter needs very little attention.

APPROVED BY POWER COMPANIES—Meets all polyphase motor starting requirements of AIEE—EEL—NEMA—reduces voltage fluctuations—does not open the line during the starting period.

PROVED IN SERVICE—Wagner pioneered this Motor-Starter Combination—has been furnishing it for more than 18 years—its steadily increasing popularity is proof of its efficiency and dependability.

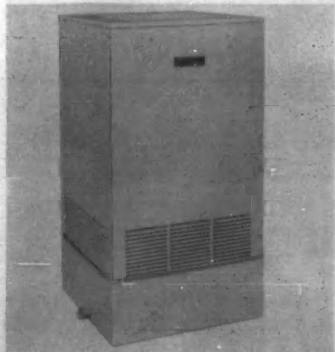
Why not take a look at Wagner Increment Motor-Starter Combination in operation? Ask your nearby Wagner Sales Engineer to show you an installation in your area. See how it works—judge for yourself, and let him help you select the combination that meets your requirements. Just call the nearest of our 32 branch offices, or write for Bulletins MU-128 and MU-195.

Wagner Electric Corporation
6441 Plymouth Ave., St. Louis 14, Mo., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

Looking for
a Business to Buy . . . ?
Check the
Business Opportunities
Section
in the classified
advertising columns.



Arkla-Servel Announces New Cooling Tower

Available in models TG-10 and TG-15, a new cooling tower for use with the "Sun Valley All-Year" gas air conditioner has been announced by Arkla Air Conditioning Corp., Dept. AC&RN, Shannon building, 812 Main St., Little Rock, Ark.

With "Sun-Seal" design, eliminating direct sun contact with water, the models employ a new material for increasing the cooling surface, within a smaller, more compact unit, the company said.

The new material for the cooling surfaces consists of plastic bound cellulose which is specially impregnated to make it water absorbent and resistant to deterioration, it was explained.

The tower is said to combine several advantages over its predecessors, including simplified maintenance, construction, and installation, and less power consumption.



Band Machine Suited For Sheet Metal Shop

A new "DoAll" band machine particularly suited for sheet metal shops has been announced by The DoAll Co., Dept. AC&RN, 254 North Laurel Ave., Des Plaines, Ill.

The model 30M has a 30-in. throat that enables it to conveniently handle large sheets. It has a speed range from 50 to 5,200 f.p.m. which permits friction sawing of light steel sheets, the company said.

For internal cutting, the model 30M has a built-in blade-shear and welder. This feature, together with the disc-cutting attachment, is said to be particularly valuable to sheet metal, and heating and air conditioning shops.

"BUY FROM FABRIKANT"

Lowest prices for imported copper, brass, aluminum sheets, coils, manufactured strictly to ASTM and Federal specs. Large stocks all gauges and sizes on hand New York warehouse.

Orders also solicited for forward shipments.

Stocklist and prices upon request.

FABRIKANT METALS CORP.
620 Fifth Ave. • New York 20, N.Y.

"SERVING THE METAL INDUSTRY FOR OVER A QUARTER OF A CENTURY"

Door Can Be Removed, Replaced by 1 Man



A new reach-in refrigerator door that can be removed and replaced by one man without tools has been introduced by Aluminum Refrigerator Door Co., Inc., Dept. AC&RN, 416 W. Ontario St., Chicago 10.

Designed for both normal and low temperature applications, the "Ardco" door features a patented concealed hinge which emphasizes straight line design. Because of a

specially designed spherical bearing, the recessed door can be lifted up and swiveled out of the frame, even though the cooler head extends beyond the refrigerator door frame.

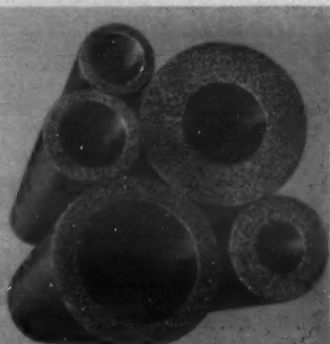
It returns to the frame in a matter of seconds and only the shoulder bolt of the door closer needs connecting to place the door on an automatic closing basis.

Both closed and open position are adjustable to degree of opening and tension of closing with use of a dime or screwdriver.

Metal posts are double slotted to provide staggered display of shelves. Shelves may be spaced as close as 5 in. apart. Shelf brackets slip into posts without normal set screws and adjustments, according to the manufacturer. Shelves have four welded studs on the bottom that slip into brackets.

Doors are made in three sizes, approximately 2 ft. by 4 ft. 7 in., 2 ft. by 5 ft. 3 in., and 3 ft. by 5 ft. 6 in.

Closed Cellular Tubing Available In More Sizes



or cooling tubes," it was stated. "The new tubing sizes are made possible through Rubatex's recently developed extrusion process in which virtually any linear shape can be produced."

Rubatex now offers tubing in wall thicknesses of 3/16, 1/4, 3/8, 1/2, and 3/4 in. with all standard diameters from 3/8 to 4 1/2 in. It can be ordered ready to slip directly onto piping or slit lengthwise to be sealed to piping with an adhesive.

Five-foot lengths of Rubatex can be supplied to original equipment manufacturers, industrial, commercial, or residential users in all inside diameter sizes. Random lengths are available up to and including 1 1/2-in. inside diameter.

Its closed cellular rubber tubing is now being made available in sizes to fit any piping insulation requirement, according to Rubatex Div., Great American Industries, Inc., Dept. AC&RN, Bedford, Va.

Designed to provide positive insulation for all warm or cold fluid piping, Rubatex tubing "provides an effective seal to keep temperatures constant while preventing condensation on heating

For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zoni, mail this ad with your name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich.
Only 25¢ each.

NOW...A SIMPLIFIED LINE of refrigeration controls!

Your inventory is simplified...yet, you get the capacity and versatility to satisfy all refrigeration requirements. Penn single pole models are rated to 16 Amps., 115 V., 10 Amps., 230 V. single phase...two pole models, rated 24 Amps., 115 or 230 V. single phase.

And, you get real economy. The two pole heavy duty controls handle polyphase motors without use of magnetic starters (where protection against overload and single phasing is provided). With their two separate circuits, these models are really 2 switches in 1. Don't settle for less...

Ask your wholesaler!



Series 270 single pole and Series 1272 two pole single function for either low or high pressure. Also temperature models.

Series 271 single pole and Series 1273 two pole dual function. Temperature models also available.

PENN CONTROLS, INC. Goshen, Indiana

EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

What's Going On in Commercial Refrigeration

News of Markets, Products, Methods

21st Dairy Industry Exposition Will Open Dec. 8 on Navy Pier

WASHINGTON, D. C.—The 21st Dairy Industries Exposition will probably unveil more advances in technology and scientific achievement than any exposition since 1946.

That's the opinion of qualified technicians and dairy industry people who have had a chance to preview what will be some of the nearly 400 displays in the forthcoming biennial showcase of dairy industrial equipment, supplies, and services.

The exposition will be held Dec. 8-13 on Navy Pier in Chi-

cago. All exhibitors are members of Dairy Industries Supply Association, and to DISA's Washington headquarters have come details of booth displays being planned for December.

An experienced dairy industrial technologist who has reviewed some of these details offered brief indicators of some of the displays, including the following:

Brand new freezers, ice makers, compressors, and advanced refrigeration equipment will be the center of at least eight

exhibits. In one, a new multi-cylinder ammonia compressor will hold the spotlight, in another an aluminum-clad air agitated ice builder will be featured, and in still others, special applications which will fit one—or hundreds—of special uses.

Mobile refrigeration has occupied the majority of manufacturers of transportation equipment in the dairy industries, and probably a baker's dozen of them will unveil new units which have been undergoing

rigid tests for the past several years.

Over-the-road bulk transport of milk, which is corollary to the "revolution" brought about by the use of the bulk farm tanks which have been featured at recent expositions, and which will be conspicuous also in this year's, will be given special attention. New safety features, easier cleanability, and—in at least one case—an outside support of extruded aluminum rings are among the promised developments.

Among the innovations promised in insulated truck bodies are a new walk-in type of ice cream truck body which allows reportedly easier access to products; a new forward control milk body and a drop frame ice cream body; and new types of insulations and other barriers for retaining low temperatures.

A wide range of vending machines for dairy products, many of which have been exhibited previously but which now have embodied new principles of refrigeration or dispensing or mixing of product, will be the center of attention in eight or more booths.

Manufacturers Promise Major Advances

Several manufacturers of refrigerated display cases report that major advances in design of cases and refrigeration units for them have been made in the past two years.

A half dozen or more manufacturers of counter freezers for ice cream and other soft-serve dairy foods, many of which have been exhibited previously promise new models which will reduce labor costs on upkeep while improving sanitation maintenance.

Soda fountain manufacturers indicate that 1958's latest fountains will be designed so it will be possible to prepare and serve food faster and more efficiently than at any time in the past. New applications of fountains—outdoors, in supermarkets, in homes—are also to be demonstrated.

Home Bulk Milk Dispensers

For large home consumers of milk, there will be two, and possibly more, exhibits by firms which have developed practical home bulk milk dispensers.

Among exposition exhibitors will be the following:

Refrigerated Cabinet Div., Anheuser-Busch, Inc.; Armstrong Cork Co.; Bally Case & Cooler Co.; Baltimore Alroil Co., Inc.; Bastian-Blessing Co.; Refrigeration Div., Brewer-Titchener Corp.; Carbonic Dispenser, Inc.; Cherry-Burrell Corp.; Chester-Jensen Co.; Creamery Package Mfg. Co.

Dole Refrigerating Co.; Dow Chemical Co.; Dunhill Food Equipment Corp.; Esco Cabinet Co.; Fischman Co.; Fogel Refrigerator Co.; Freezer Box Div., Annapolis Yacht Yard, Inc.; Freezing Equipment Sales, Inc.; Frick Co.; General Equipment Mfg. Co., Inc.; Gorton Mfg. Co.; Grand Rapids Cabinet Co.

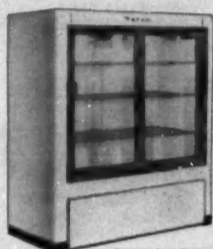
Jamison Cold Storage Door Co.; Karl-Kold Co.; Kelvinator Div., American Motors Corp.; King Zeero Co.; Stanley Knight Corp.; Kold-Hold Div., Tranter Mfg., Inc.; Manitowoc Equipment Works, Div. of Manitowoc Co., Inc.; Mohawk Cabinet Co., Inc.; Mojonier Bros. Co.; Monitor Dispenser Co., Inc.; Bulk Tank Div., Paul Mueller Co.

Norris Dispensers, Inc.; Pennsalt Chemicals Corp.; H. A. Phillips & Co.; Port Morris Machine & Tool Works, Inc.; Refrigeration Engineering Co.; Savage Ice Cream Cabinet Div., C. V. Hill & Co., Inc.; Schaefer, Inc.; Solar Permanent Co., Div. of U. S. Industries, Inc.; Sweden Freezer Mfg. Co.

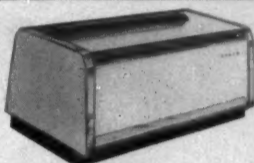
Tekni-Craft; Thermo King Corp.; Emery Thompson Machine & Supply Co.; Tropic-Aire Div., McGraw-Edison Co.; United Refrigerator Co.; Vendo Co.; Vilter Mfg. Co.; Vitafreeze Equipment, Inc.; Weber Showcase & Fixture Co., Inc.; St. Paul Div., Whirlpool Corp.; Wilson Refrigeration, Inc., Div. of Tyler Refrigeration Corp.; Haverly Equipment Div., John Wood Co.; York Corp.

COLD, BOTTLED BEVERAGES SELL FASTER!

Popular Tyler Slide-Door Refrigerator with heavy-duty blower-cooling for high-speed cooling of bottled beverages. Use it also for fast sales of dairy products, table-ready meats, etc. Finger-touch, sliding glass doors. Big capacity in small space.



Tyler Slide-Door Refrigerator (Self-contained)



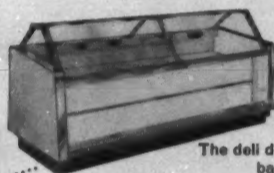
Tyler 6 ft. Dual Temperature Sales-Case (Self-contained)

SELL MORE OF EVERYTHING!

Today push ice cream special; tomorrow a fresh meat specialty; then a ham 'n egg deal. Change as often as you like. Just twist dial to normal or zero temperatures. Models: island; wall, with or without superstructure.



DELI PRODUCTS ATTRACT CUSTOMERS—BOOST MEAT VOLUME!



Tyler Delicatessen Sales-Case

The deli department is coming back strong... racking up impressive profit gains. Spot near fresh meats... boost volume in both departments. Tyler Deli Sales-Case in 8' and 12' display lengths.



SPEEDY 4-WAY SHOPPING BOOSTS SALES OF "SPECIALS" RELATED ITEMS!



MULTIPLY TURNOVER with this New Short-Cut to Profits!

Tyler Air-Screen Sales and Storage Cooler! Wide-open, self-service sales and display, all the storage you need—in one, step-saving combination. Load shelves direct from inside cooler. Meats, dairy products, produce, bottled beverages move faster—in volume! Wide-open, vertical, mass displays as long as you want. Huge lineal shelf capacity. Adjustable shelves—horizontal or sloped.

*Trademark



Tyler Air-Screen® Combination Sales and Storage Cooler

Use this Tyler space-saver to speed turnover of all types of perishables. Move easily from one location to another for "spot" merchandising... end-of-gondola display... near checkouts! Takes just 3' x 5' floor space.



Tyler Refrigerated Display Table (Self-contained)

HIGH-PROFIT IMPULSE ITEMS MOVE TWICE AS FAST!



Tyler 4 ft. Adjustable-Shelf Sales-Cases (Self-contained)

Powerful vertical display—easy-see, easy-reach! Just the thing for "spot" or end-of-gondola display of dairy products, meats, produce, bottled beverages. Big capacity! Adjustable shelves; removable for mass display!



Copyright 1958, Tyler Refrigeration Corporation, Niles, Mich.

TYLER

PIONEER of important improvements

TYLER REFRIGERATION CORPORATION, Niles, Mich.
Canada: Tyler Refrigerators, 732 Spadina Ave., Toronto, Ont. (Export: Tyler Refrigeration International, C.A., Apartado Postal 9262, Caracas, Venezuela, S. Amer.)

MOVE
AHEAD
WITH
TYLER!

Tyler Refrigeration Corporation, Dept. AR-11 Niles, Michigan
Send data on ☐ new Tyler Air-Screen Cooler ☐ Slide-Door Refrigerator ☐ Dual Temperature Sales-Case ☐ Delicatessen Sales-Case ☐ Refrigerated Display Table ☐ Adjustable-Shelf Sales-Case ☐ Condensing Units ☐ Shelving ☐ Checkouts ☐ Sales-Cases for

NAME _____
ADDRESS _____

Tyler Tells Field Men

Supermarket Operators Turning To Mfr. for Authoritative Installation, Operation Data

NILES, Mich.—“One of the facts of life which commercial refrigeration manufacturers must face is that supermarket operators are turning more and more to the manufacturer for authoritative installation and operation information. The day is about gone when the store owners depend solely on the installer/serviceman for all handling of his refrigeration equipment.”

One reason for this, according to C. A. Hinkley, director of education and applications engineer at Tyler Refrigeration Corp. here, is that “in spite of the many improvements made in equipment over the years, there are recurring field problems—problems due primarily to poor planning or weak installation practices.”

Hinkley was speaking to a meeting of all Tyler fieldmen, sales and service, who attended a three-day session with the theme “Better Professional Salesmen.”

Pointing out that of the \$46.5 billion in retail food sales last year, \$22.5 billion was in refrigerated items, Hinkley showed that emergency refrigeration service can account for 3% of a supermarket's gross profit dollar—an amount exceeded only by payroll.

He cited \$15 million spent on installation of equipment in some 1,800 new stores built last year. These same stores spent some \$4 million for emergency refrigeration service.

82-Store Chain Spent \$210,000 on Emergency Refrigeration Service

A specific example of refrigeration service costs: “One chain of about 82 stores spent \$210,000 on emergency refrigeration service. The overwhelming amount of this was callback service traceable to poor installation practices—troubles like drains, non-condensables, and control settings.”

“When we recall that 35-40% of store area is now refrigerated display, and that 60% of new supermarkets are failing to reach anticipated sales volume, we can understand operators' concern with everything that bears on the profit and loss picture,” he continued.

“Reduction of refrigeration service costs looms large as a place where savings can be realized.”

“It is natural for a dissatisfied user to blame equipment when service costs mount or when food spoilage is high, so it is to the advantage of the equipment manufacturer to take all steps economically possible to assure proper installation and operation of his products.”

With this background, Hinkley then introduced Tyler's complete plan of equipment and installation specifications—a plan already pilot-tested in several areas. Immediately recognizable advantages of the system, according to Tyler, are:

a. It makes possible the prediction of installation costs—

thus making contractors' bids more realistic since competitive bids will be based on exactly the same information.

b. The system allows a workable cost control procedure once equipment is installed.

c. It improves the contractor/customer/manufacturer relationship.

“In no way is Tyler getting its finger in the contracting pie,” Hinkley emphasized. “But, as a result of this system, the customer is assured of an installation package made according to manufacturer's recommendations; the contractor knows that he is bidding on exactly

the same information, the same length of tubing, even the same number of fittings, as his competitors and can make his bid more confidently; the manufacturer can show that his equipment performs as described in his sales literature and not be blamed for difficulties caused through faulty installation.”

Key To Control System

Key to Tyler's control system is a copyrighted worksheet called the “Installation Specification Summary.”

Breaking the proposed store into meat, dairy, produce, frozen food, and ice cream depart-

ments, the form calls for detailed data on all equipment, refrigerant lines, electrical specifications, and control settings.

Starting with the linear feet of case required, the equipment headings assure procurement of and consideration given to: B.t.u. requirements, condensing unit sizes, cooler coil models, and type of mounting in machine room.

Liquid lines are listed for 3/8 in. and 1/2 in. Suction lines are shown for 5/8 in. through 1 1/2 in. A column is included for approximating the initial refrigerant charge.

Case amps, machine amps, defrost amps, and canopy lighting circuit amperages are listed in electrical specifications under 110-volt or 208/220/230-volt headings. Defrost control settings are indicated, as are present control cut-in and cut-out for each refrigeration system in the store.

To use the Installation Specification Summary effectively, a drawing of the store must be made or obtained. Then an overlay can be made showing only the refrigeration layout. This should include the location of all cases and such things as trenches, drains, refrigerant line risers, and the like.

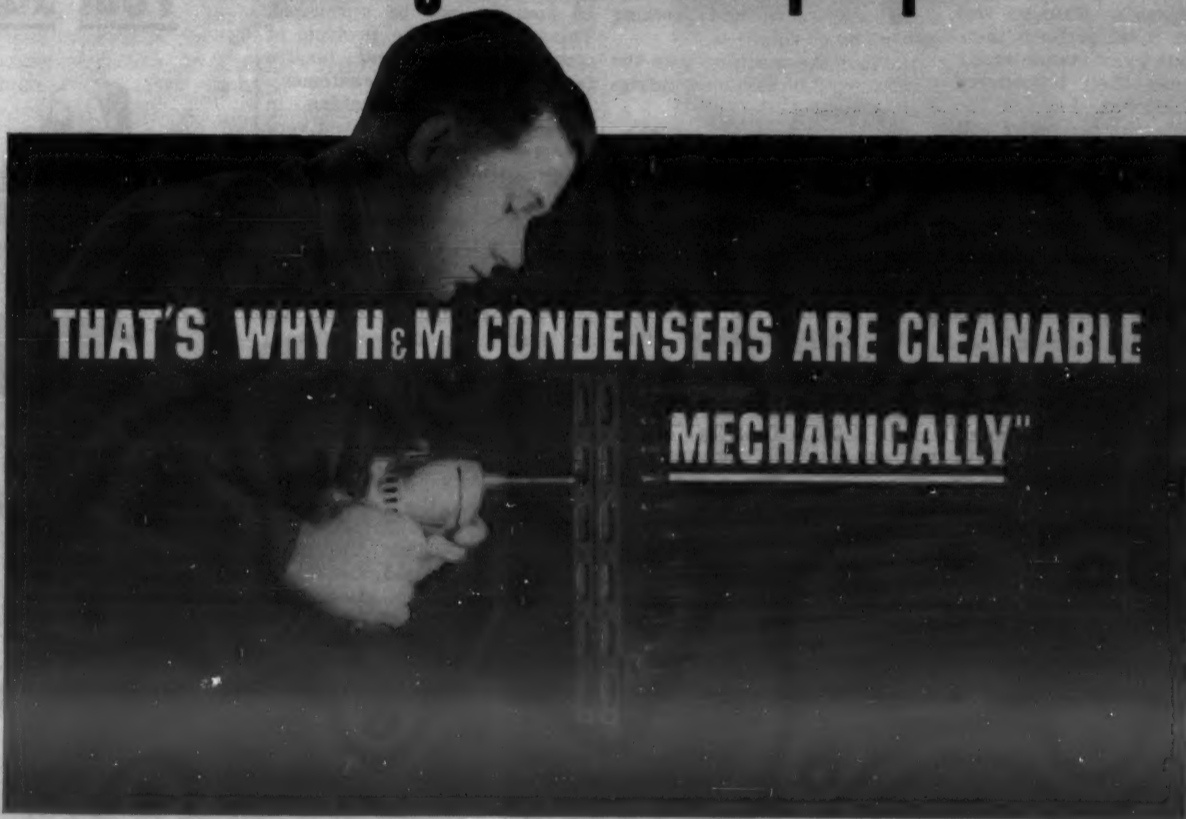
Each case should be identified by a letter or a number with the machine serving it. Advantage of this is obvious, since it allows immediate identification of compressor/case relationship when any servicing is being done later. Such labeling also makes it possible to draw and determine exact refrigerant line distances. A few stores have gone as far as to attach a metal identification tag or decal to each case in the store.

The technical information needed to fill out the columns on the Installation Specification

(Concluded on next page)

SO HALSTEAD & MITCHELL ENGINEERS SAID:

"Harsh chemical cleaners ruin condensers, cooling towers and pumps



THAT'S WHY H & M CONDENSERS ARE CLEANABLE
MECHANICALLY

Scale and sludge which reduce heat transfer can be removed easily from Halstead & Mitchell Cleanable Water-Cooled Condensers. A simple, spiral cleaning tool—available from your local H & M distributor—and an ordinary electric drill can be used to clean the water tubes safely, mechanically. No need to use strong chemicals, which can seriously shorten the

life of your condensers and ruin cooling towers and pumps, too.

H & M Condensers have double-tube design, seamless copper tubes. Counterflow of refrigerant and water assures maximum heat exchange. Brass headers are quickly removed for cleaning. All H & M units are U/L approved for use with Refrigerants 12 or 22.

ALL H & M WATER-COOLED CONDENSERS ARE CLEANABLE

STANDARD DUTY (Type EU) are made with extended surface water tubes. Ideal for water-cooled systems under all average conditions. 1/3 thru 3 tons.

HEAVY DUTY (Type T) condensers have a highly favorable fouling factor and are designed for long service between cleanings. 1/3 thru 25 tons.

SEA WATER DUTY (Type SW) are made with cupro-nickel water tubes and naval brass headers for resistance to impure water. 1/3 thru 25 tons.



Ask for H & M products at your distributor's. Write for descriptive literature. Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.

WATER-COOLED CONDENSERS • COOLING TOWERS • AIR COOLED CONDENSERS • FINNED COILS

Supermarkets --

(Concluded from preceding page)
Summary is available, for Tyler equipment, from the Equipment Specifications Guide.

"Contractors and operators in pilot areas have received our complete planning aids with enthusiasm," reported Hinkley. "Copies of the completed summary are found in the machine rooms of supermarkets using the procedure as well as in the files of the contractor, customer, and Tyler."

A further form, in the development stage, will allow cost accounting on refrigeration equipment in a more convenient manner, according to the company.

After introduction to the system, Tyler fieldmen were separated into groups, and each group was given a kit showing the four walls of a store. Their job was to determine the store sales volume, then use the Tyler aids in laying out the complete store, from merchandising layout to the mechanical plan.

"In effect," Hinkley concluded, "this procedure allows a couple hours of planning to save hundreds and thousands of dollars in service and maintenance of refrigeration equipment. Local responsibility is maintained; store planners and distributors must perform their function, but Tyler stands ready to help make their procedures more professional. And, in the final analysis, the procedure will help eliminate breakdown maintenance increasing net profit, thereby, for both the customer and the installer."

As part of its introduction of the new system, Tyler has produced a 20-minute, 16-mm. sound motion picture, "Your Keys to Profit," which graphically portrays the application of this procedure in an actual store installation. This film is available to Tyler agents, customers, and their service organizations, including contractors. There is no charge for the use of the film.



LEFT: Loading Shell-Ice into bags from storage bin located directly under ice machine.

RIGHT: Customer gets ice in individual water-proof bag from W. Henning, president of Cold, Inc., ice making plant in State College, Pa.

No More Dirty Ice

Ice Maker Eliminates Need for 3 Men To Run Plant; Dirty Ice Problem Disappears

STATE COLLEGE, Pa.—Installing a 5-ton Frick Shell-Ice maker has so increased the packaged ice volume of Cold, Inc., ice making plant here, that the machine cannot keep up with demand, reports William Henning, president of the company.

Henning bought the machine when he discovered that many of his crushed ice customers were buying their own ice machines because of the problems raised by dirty, cloudy ice, slush and snow, and freezing into globs of solid ice.

He tied the machine into the plant's regular ammonia refrigeration system.

LABOR CUT 75%

One of the major savings on this installation was labor, Henning said. "We eliminated the three men needed to run the ice plant and brought our labor costs down 75%," he commented.

"We also completely eliminated the problem of dirty ice. We now furnish ice to about 35 fraternity houses at Pennsylvania State university, diners, restaurants, milk company, hospital, many homes, and our own vending machine."

"Many of our customers have

given up the idea of purchasing their own ice machines since using Shell-Ice.

Henning added that he also does a large business of Shell-Ice over the counter. He has recently installed an automatic dispensing unit in nearby Bellefonte.

COUNTER BUSINESS GROWS

"Counter business has grown so fast that we have started using a strip coupon for ice purchases," he said. "A strip of 10 coupons can be purchased. This eliminates the problem of money handling and insures faster service to the customer."

"Our vending machine in Bellefonte has also proved very successful. We find we must make more calls each week to restock. Our machine is now running seven days a week to keep up with demand."

"I wish we had done this two years ago," Henning commented. "Had we known how successful Shell-Ice would be, we would have bought a larger machine initially."

In addition to his crushed ice business, Henning also operates a frozen food service plan and a public storage locker.

To handle the refrigeration for ice making, cold storage, and quick freezing, Cold, Inc. has a Frick 4 by 4, 5 by 5, and 6 by 6 compressor and a six-cylinder booster system.

One model AU 155 air cooling unit supplies cold air for the public storage quick freezer and a single Frick air cooling unit cools the large blast freezer to -38° F. for the food processing plant.



Soft Ice Cream Exposition Set for Chicago Dec. 4-6

CHICAGO—Soft ice cream industry exposition and convention will be held Dec. 4-6 at the Shoreland hotel here under the sponsorship of the Soft Serv Dairy Products Association, it has been announced recently.

Attendees will include drive-in operators, according to the announcement by Irv Venzke, chairman.

Harry J. Kimpel, executive secretary of the association, is the exposition's managing director. The association's headquarters are in Cleveland.

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PRE-COOLER

THE LINE THAT'S PROFIT DESIGNED FOR YOU

Teamwork Makes Bigger Profits For COLDIN DEALERS



Coldin works with you . . . helps you sell . . . offers you merchandising and promotion aids and paves the way for sure, easy profits.



Your Key To Better Refrigeration

COLDIN
CABINET CO., Inc.

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Model DD 82-S

• New — Refrigerated "Utility" Compartment

• New — Compact, Functional Designs for Bigger Capacity

• New — Trouble Free System Eliminates Costly Service

Here are coolers that are boosting draft sales right across the country. Big, roomy Beverage-Air Coolers that hold up to 3 kegs on top, 1 on storage and 3 to 4 cases in "Utility Compartment." They offer the best balanced cooling system available—assure low cost cooling from keg to faucet valve. All models with stainless steel tops and stainless or baked enamel sides and ends.

FACTORIES: Punxsutawney, Pa., Spartanburg, S. C.

WAREHOUSES: Pittsburgh, Pa.; Trenton, N. J., Memphis, Tenn.

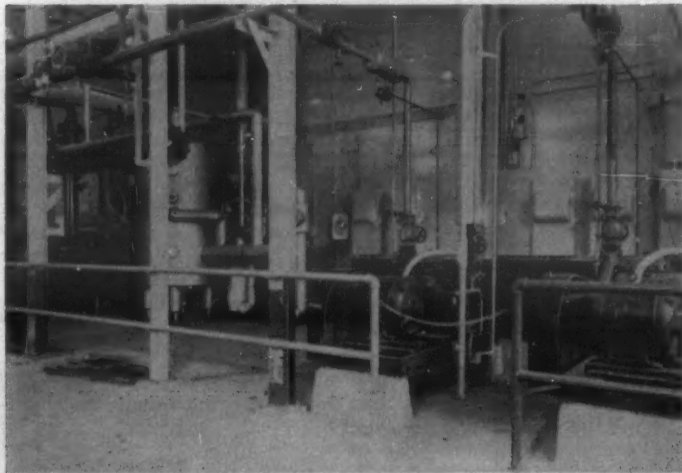


Model DD 82-S

Write for complete catalogue data—FREE. Ask about Beverage-Air Ice Maker Coolers

BEVERAGE-AIR

705 Third Street Punxsutawney, Penna.



The refrigeration system for Southeastern Bonded Refrigeration Warehouse was designed not only to take care of the present storage area of 160,000 cu. ft., but also to accommodate future expansion, which will add more than 844,000 cu. ft. of storage. This will be done simply by adding coils in the new rooms, and compressors and an intercooler in the equipment room.

Warehouse Has 160,000 Cu. Ft. of Space

RALEIGH, N. C. — New Southeastern Bonded Refrigeration Warehouse opened here late last year now offers 160,000 cu. ft. of freezer space for chain stores, distributors, institutional accounts, and other primary buyers.

Constructed of new-type integral tar and gravel roof, specially-built insulated cement floor with underfloor heating, and prefabricated walls, the structure was designed by Reony Sales and Engineering Corp. of Richmond, Va. to serve the Carolinas, Virginia, and Georgia.

Processing sites are available adjacent to the warehouse and several packers have begun building facilities in the area.

First low temperature storage section was full before Christmas. P. O. Poole, president of the firm, says he hopes to have a total of 320,000 cu. ft. of storage space in operation by the end of this year.

Present plans call for an additional 224,000 cu. ft. of space to be added next year, and 460,000 in 1960.

Completed in what is claimed

to be a record 110 days, construction was carefully watched by Reony's president and designer of the job, V. C. Patterson.

Engine room is equipped with a surge drum, piping, and pumps laid out with an eye to the future to serve the entire planned frozen storage capacity of 1 million cu. ft. All that will be necessary to put new rooms in operation is addition of compressors and intercooler to the engine rooms and coils to the new storage rooms, Patterson said.

Cooled Stream Increases Life Span of Trout In Toledo Zoological Gardens

TOLEDO — At the Toledo Zoological Garden, the water temperature of the artificial trout stream averaged 75° F. Accustomed in the natural habitat to a mean temperature of 55°, the trout were found to be sluggish and short lived.

DECIDE TO CHILL WATER

Zoo Director Phil Skeldon referred the matter to Clyde Stoneking, manager of Williams & Co., refrigeration wholesaler, and it was decided that chilling the water to a temperature that the trout were accustomed to would solve the problem.

First, Stoneking had to determine the amount of water in the trout stream which has these variables: 100 winding ft. long, 6 to 8 ft. wide, and 16 to 18 in. deep along its course. This information was needed so that he could decide on the proper size unit that would constantly maintain a temperature of about 55°.

25-TON CHILLER USED

A 25-ton Heat-X package chiller, installed by Davison Associates, was the answer. Drawing from a 42,000-gal. tank, located behind the refrigeration equipment, the water is pumped through the package chiller and then returned to the tank where 50 to 52° temperatures are maintained. The water is then

circulated to the head of the stream at the rate of 15 g.p.h. Thermostatically controlled, the machine operates on a 45-minute "on" and a 55-minute "off" cycle.

With the installation of the packaged chiller, the trout are livelier and because of their increased life span, costly restocking of the stream has been eliminated, it was further reported.

Booklet Describes Museum

LOS ANGELES — An illustrated booklet on the Recold Museum of Air Conditioning and Refrigeration is now available from Recold Corp., 7250 E. Slauson Ave., Los Angeles 22.

Restaurant Show Set For May 11 to 15

CHICAGO — Fifty-six manufacturers of refrigerated equipment have signed up for display space in the 1959 National Restaurant Exposition, Ralph G. Peterson, exposition director, announced recently.

The exposition will be staged at the Navy Pier here from May 11 through May 15. It is sponsored by the National Restaurant Association.

Thinking of —

- changing territories
- expanding your territory
- taking on new lines—

Check the
CLASSIFIED ADS
Your opportunity may
be there.

This is Shell-Ice



CLEAN

MADE OF STAINLESS-STEEL
TUBES—NO RUST

NO WASTE

CLEAR HARD PIECES—
NO SLUSH or SNOW

COOLS FASTER

MORE COOLING SURFACE
(CURVED)

LASTS LONGER

SOLID—HARDER THAN
CRUSHED ICE

CHEAPER

MADE AUTOMATICALLY
1/4" to 1/2" THICK

EASY TO HANDLE

CAN BE CONVEYED, BAGGED,
OR BLOWN THROUGH A HOSE

Frozen on the outside of stainless-steel tubes by means of direct-expansion ammonia . . .

Shell-Ice is the answer to all users of broken or crushed ice. The entire operation is handled by automatic controls and Shell-Ice is ideal for all businesses governed by food and health regulations.

The frozen Shell-Ice usually falls by gravity feed into a storage bin below the machine. From here the ice can be easily used or fed on conveyors to other places needed.

TYPICAL COMMENTS BY SHELL-ICE USERS . . .

Ice Plant Owner—"Can't keep up with demand, many customers have given up idea of buying own ice machine since using Shell-Ice. Cut labor costs 75% for making ice."

Dairy—"Works better than block or crushed ice for cooling our milk; cools quicker and lasts longer."

Restaurant Manager—"No problem of dirt in drinks, doesn't freeze into solid globs, and cools drinks quicker."

If you use ice for any type of cooling, or resale, you can't afford not to find out the full story on how Shell-Ice can help you improve your operations.



DEPENDABLE REFRIGERATION SINCE 1912
FRICK CO.
WATKINSBURG, TENN. U.S.A.

Your Customers' Best Buy. . .

(and yours, too!)

IDEAL Speed-Freeze PRODUCTS

BEVERAGE COOLERS
unexcelled storage
capacity with
Ice Cube Makers
OUTSTANDING
SECTIONAL METAL
WALK-IN COOLERS

IDEAL

COOLER CORPORATION

7830 MAGAZINE ST.
ST. LOUIS 8, MO.

*a light touch**
AND IT'S SEALED!

Jarrow's *Safeseal* Gasket...
developed for the new safety-type spring
and magnetic refrigerator and freezer doors.

OPEN

air quickly deflated

SEALED

PATENT APPLIED FOR

Positive seal is assured with as low as 4 lbs. pressure because "Safeseal's" soft-acting rubber is sensitive to the lightest touch.

"Safeseal" can be made to your exact requirements for any low-tension spring or magnetic door, based on this patented design. Send us blueprints of your doors.

Jarrow experienced engineers can help solve your every gasket problem. No cost or obligation for this service. Write today.

JARROW PRODUCTS INC.
Almost a Third of a Century of Gasket Experience
1238-50 W. FULLERTON AVE. • CHICAGO 14, ILL.

Report on Education

Another article in a series dealing with all levels of education and training in the air conditioning and refrigeration industry.

By Frank J. Versagi, Technical Editor

9. What and How Schools Teach

In practice, at one extreme we have those who feel a serviceman is a mechanic and nothing more. "Over 80% of all service troubles are routine ones which need nothing but mechanical experience to handle," one instructor pointed out. "We would not be giving a man his money's worth if we spent a lot of time on academic background which he will never use, for in real life, he calls his boss whenever he's stuck on an unusual job."

"When a man is working on a milk cooler 15 miles out of town, and finds a non-routine trouble, he's no good to himself or his boss if he doesn't have enough background to sit down and figure out what might be wrong," counters another instructor.

And what do the students say?

Actually, the NEWS found that most students at various schools had nothing to which to compare the training. Therefore, whether they are given the practical or academic approach

has no meaning to them at the time. Occasionally, one hears a comment such as "What good is Ohm's Law going to do me when I'm on my knees in a basement somewhere working on a unit?" or "I knew how to use a ratchet wrench before I came here; I would have liked more on what makes the stuff work."

Experienced Servicemen Value Academic Training

When talking to servicemen who have had several years' experience, however, the attitude is more one sided. While there is still the man who feels he can get by without knowing the why of things, more servicemen admit the need for academic training to some degree.

These latter men disagree on how deep the training should go, but they see the need for more than training in manipulative skills. For the most part, these are the 5% to 20% of franchised servicemen who make it a point to take manufacturers' courses. These are also the type who take active interest in trade

associations or societies, who read the trade papers, who attend clinic-type courses wherever they are held.

Speaking of types of people brings up another problem common to most schools below the college level. This is the problem of the uneven make-up of classes.

The same instructor in a trade, association, or manufacturer's school may have a class composed of people with grade school, high school, even college educations. There will be quick learners and slow learners, really interested people, and people who are there because their boss sent them. There will be some who can read well; other bordering on illiteracy.

Perhaps the problem is greatest in manufacturers' schools where the students are also the company's customers. Thus, in a regular class, the instructor might use discipline, ridicule, understanding to establish a level at which he can teach. When students are also your customers, however, you don't browbeat them or do anything which might embarrass or irritate them. At least that is the feeling of most company instructors.

In fact, a common failing in such schools is that instructors tend to overdo the Dale Carnegie approach; they are so preoccupied with making friends of their students that they dilute their teaching effectiveness.

The trade or public school teacher, on the other hand, while he would be unwise not to instill a friendly atmosphere in his class, does not feel obligated to do so.

Heterogeneous Make-up Of Classes Is Problem

In all cases, the heterogeneous make-up of classes poses a major problem for teachers. At one trade school, for example, in the early phases of instruction, the determination of areas was being discussed.

"Is a diameter half of a radius?" asked one student. It happened that the instructor in this case was understanding and knew that some of his class were semi-literates looking for some way to better themselves. The question was sincere and was answered sincerely.

But the point is that in this

same class were people already working in the trade and coming for review. And most of the class were intellectually somewhere in between. In such cases it becomes almost impossible not to bore some and confuse others. The instructor can only do his best at establishing a common learning level.

Handling the 'Smart Boy' In the Class

Every instructor, at all educational levels, has also been plagued with the bright boy—the fellow who knows more than the instructor and who does not hesitate to inform everyone of this fact. The sad part of it is, some teachers admit, that occasionally the fellow does know more than the teacher!

Some teachers meet the heckler at his own level and trade verbal blows with him during class. This has its dangers in that, if the teacher loses a verbal battle, it may lower his standing in the eyes of the class. In public institutions, formal disciplinary methods may be used. Here, again, the manu-

facturer's instructor cannot feel free to handle such people as he might like.

Extremely effective is the technique of telling the bright fellow that he seems to be quite ahead of the rest of the class, and rather than confuse other students with discussion of his question at the moment, "we'll discuss it after class." Deprived of his audience, the fellow normally forgets the whole thing after class.

One fact which stood out at all of the schools was that the lower an individual stood intellectually, the more sincere he tended to be. It was the slow learner, the semi-literate who studied hardest, who—even at manufacturers' factory schools—stayed home evenings and studied while the brighter people took in the town.

Unfortunately, many teachers overlook this sincerity and effort on the part of slower students, and they spend most of their time and attention on those with whom it is easier to communicate.

(To Be Continued)

York Clinics Training Distributors

SOUTH BEND—"I've been held in San Francisco beginning Dec. 1.

I still feel that the time and money I'm spending on this school are well spent," stated Clifford J. Schlafman, York-Clifford Refrigeration, Inc., Dayton.

This reaction to York Corp.'s two-week-long Associate Clinic held here recently. The clinic is a comprehensive training course covering everything from basic refrigeration and air conditioning theory to sales training offered by York to its distributors (associates), the second of four to be held around the country.

"Our objective in designing the clinics is to make certain that those attending will leave with increased job knowledge, improved job skills and attitudes which will help make them more successful York associates," stated J. L. Roth, manager of associate sales.

The first clinic was held in Philadelphia, the second—visited by the NEWS—in South Bend, Ind.; the third is in progress now at New Orleans, and the last will be

A high percentage of the time is spent in working the problems—hours being spent on a single problem in some cases. Interviewing the students, the NEWS found them heartily in favor of the heavy work schedule and relatively long course. (During the second week, two associates received cards from their wives beginning "Dear Friend.")

York district representatives serve as moderators at the clinics; they may also instruct. Other instructors are brought in from the home office.

Total effect of all this work should be to enable associates to submit "sharper estimates, be more competitive and at the same time enjoy better profit margins," said Roth.

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Utilizing advanced design Molecular Sieve cartridges, these new Remco Filter-Driers combine unequalled drying efficiency, effective acid removal, generous flow capacity and depth filtration.

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"T" FITTING TYPE in 2 to 6 tons, are readily adaptable to systems using conventional "T" driers.

Remco Molecular Sieve Filter-Driers are available at leading wholesalers. Ask your wholesaler for more information, or write for Bulletin MS-1. Remco, Inc., Zelienople, Pa.

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Large Air-Cooled Condensers (2)

Controls for Winter Have Led To Wider Use, Says D. E. Kramer, In Outlining Advantages and Problems Involved In Their Use

(Last week, the News began a report on a talk given by D. E. Kramer, engineer, Kramer-Trenton Co., on winter control procedures with large air-cooled condensers.

Kramer listed the several winter-occurring problems as: inadequate flow through expansion valve when receiver pressure is sharply reduced; unreliable compressor starting in low outdoor temperatures; excessive compressor cycling on startup; prolonged or incomplete defrost time; and uncertain defrost termination.

Following is the conclusion of the corrective procedures he outlined for these problems.)

Kramer gave the calculations necessary to determine what fraction of the total refrigerant flow is required in the by-pass in order to maintain a typical 96° F. condensing temperature. He described typical applications of the by-pass systems, such as the open by-pass using a restricting valve at the condenser outlet and an open by-pass connected between the compressor discharge and receiver.

Another by-pass system uses a modulating valve at the combined outlets of all but one of the multiple circuits. "Instead of sequentially closing individual condenser elements, the modulating valve throttles the combined circuit outlets as the outdoor temperature drops, so that all but one of the circuits are completely closed at 0° F. outside temperature."

According to Kramer, the amount of additional refrigerant needed to control capacity by flooding is "insignificant."

After describing briefly several other approaches to controlling condenser capacity, Kramer turned to the remaining four problems he listed origi-

nally—having to do with compressor starting, short cycling, defrost operation.

"Condenser isolation" is the basic attack. "To prevent the cold condenser from affecting low side pressure, the condenser must be isolated from the rest of the system during the off cycle." Condenser isolation can be accomplished by:

Discharge solenoid: a check valve in the drain line between the condenser and receiver and a discharge or suction solenoid valve which is arranged to open when the compressor starts.

RA valve: a modulating valve is used in place of a discharge

solenoid. It maintains a normal discharge pressure whatever the condenser pressure.

Short cycling on startup can be eliminated by instant receiver pressurizing, Kramer stated. Using condenser capacity control together with condenser isolation, an RA valve keeps the discharge line to the condenser shut even after the compressor starts and diverts full discharge flow to the receiver through the by-pass, providing immediate liquid pressure at the expansion valve."

On the subject of hot gas defrosting, Kramer explained that during the defrost opera-

tion the evaporator and condenser compete for the hot gas discharged from the compressor.

"When the condenser is warm," he added, "most of the hot gas flows to the cold evaporator and performs a prompt defrost. However, in winter, enough hot gas may be diverted to the cold condenser to prolong or prevent defrost."

The same solutions which effect capacity control and condenser isolation are major steps in controlling this last problem, according to Kramer.

To Service Auto Air Conditioners

MEMPHIS — Camp Electric Co. will add two new operations to its business—the servicing of auto air conditioners and auto radios—when it moves to the building at 647 Madison which it purchased recently.

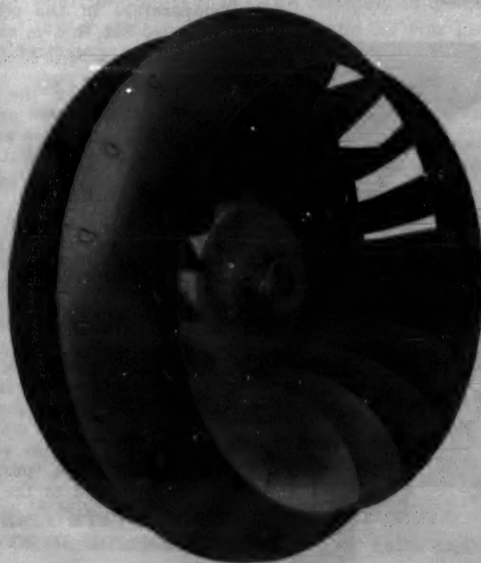
Sporlan Reorganizes Field Sales Offices

ST. LOUIS — Sporlan Valve Co. announces a new organizational structure for its field sales offices.

The new setup groups Sporlan's 17 nationwide sales offices into nine geographical sales districts.

To head the new areas, nine veteran Sporlan sales engineers will be promoted to district managers. The field offices will continue to function as such but will be under the supervision of their respective district managers.

According to W. H. Krack, general sales manager of Sporlan, "The re-organization will give new strength to our national sales force with untold benefits in service to Sporlan customers."



TORRINGTON CRACKS THE NOISE PROBLEM The squeeze toward compactness in room air conditioners has forced the decibel level up to the point that *noise is now the No. 1 problem.* In anticipation of this trend, two years ago Torrington's air impeller laboratories went to work on "noise." The result is the revolutionary Torrington H Wheel—one of the most important breakthroughs in air conditioning history. In one room air conditioner application test the H Wheel reduced the noise level from 63 to 53 decibels, and it was less than *one half as loud.* Torrington's engineering department is now offering samples of the H-Series Wheel for evaluation in your new product development program.

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A Few Territories Open Write for Data Sheet

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Brisk Metal Products To Expand Again

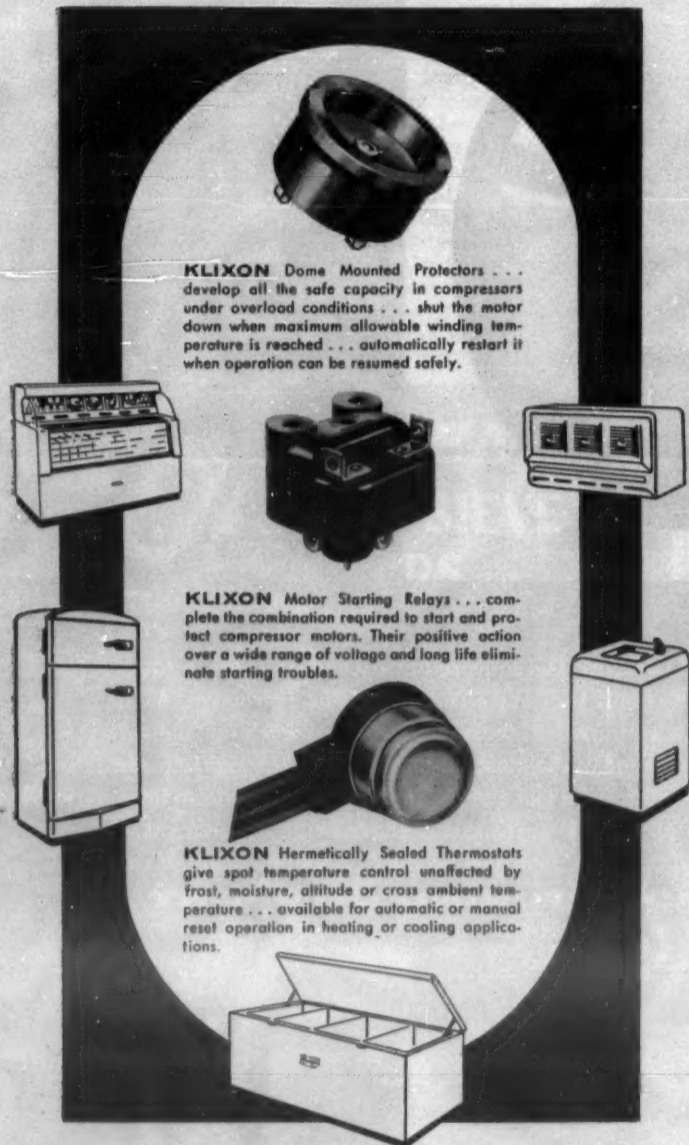
NEW YORK CITY—Increasing demand for factory-fabricated extruded aluminum louvers, solar canopies, and vent housings has forced Brisk Metal Products to expand plant capacity for the third time in as many years, it was announced by Frank Raggio, sales manager.

The new plant, at 39-18 Thirtieth St., Long Island City, N. Y., is laid out assembly-line fashion for efficient conversion of extruded stock and components into finished products ready for shipping, it was stated.

Brisk louvers are sold through the main office at 103 Park Ave. here, and through a nationwide network of sales agents.

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Refrigeration equipment is expected to perform just as dependably when operating conditions are difficult as when they are favorable.

Mostly this is a question of keeping refrigeration compressors running at maximum safe capacity under overloads, high room temperature, low line voltage, etc., or combinations of such abnormal conditions.

The KLIXON Refrigeration Controls shown above have achieved a high reputation for getting the maximum safe capacity out of refrigeration systems under abnormal conditions... assuring minimum maintenance and service calls. Manufacturers of refrigeration equipment are urged to investigate KLIXON Motor Protectors, Starting Relays, and Hermetically Sealed Thermostats. Literature sent free on request.

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Refrigeration Problems And Their Solution

(As Written by Paul Reed)

Placement of Oil Separators (2)

OIL SEPARATOR MUST BE HOT

The hot gas from the compressor enters the separator at a rather high velocity, and strikes the baffles or similar "impingement" material. There, its velocity is reduced and its direction of flow is sharply changed, which causes the oil to remain on the baffles, while the gas passes around the baffles and thus out of the separator.

The oil that gathers on the baffles drips down to the bottom of the separator. It may be supposed that it is then almost pure oil. This is not true. The amount of R-12 in the oil depends on the temperature of the oil (also the pressure, but that is more or less out of the control of the separator).

If the "oil" in the bottom of the separator is cold or even cool, it may have about as much refrigerant as oil in it; that is, it may contain 30 or 40% R-12 or even more.

If this "oil" in the bottom of the separator is hot, it can contain very little refrigerant, for the refrigerant is driven out by the heat; so it may have as little as 5 or 10% refrigerant in it—rarely less, however.

We want to return as nearly pure oil as possible to the compressor crankcase, and as little refrigerant in it as we can avoid. Therefore, the hotter we keep the oil separator, the "purer" will be the oil returned to the crankcase.

INSULATE LINE AND SEPARATOR IF NECESSARY

The nearer the oil separator is to the compressor the less opportunity there is for the hot gas to cool before it gets to the separator. If it is impossible to place the high-side oil separation close to the compressor; put it as near as possible and insulate the hot-gas line from the compressor to the separator.

If the separator must be in a cool or cold place, insulate it by wrapping it with some blanket type insulation $\frac{1}{2}$ in. or so thick.

For especially cold locations, some service engineers have even wrapped electrical resistance wire (such as soil cable or anti-sweat wire) around the separator under the insulation, to keep the separator constantly hot.

One manufacturer of compressors once designed a compressor with an oil separator in the head of the compressor, where it would get the full benefit of the compressor heat. Apparently it never got into production and on to the market (probably because of cost), but it was a good idea anyway.

LOCATION OF OIL RETURN

The purpose of an oil separator is to remove as much of the oil as possible from the refrigerant, and to feed this oil as free of refrigerant as possible, back to the oil in the crankcase of the compressor.

There is certainly no reason for not feeding the return oil just as directly as possible to the crankcase. Not into the suction line certainly, for there it will again have to be separated from the suction gas, to keep it out of the cylinders of the compressor.

So as to make it just as easy as possible for the return oil to get into the crankcase, it should enter just above the crankcase oil level, but not high enough to aggravate oil splashing up on the cylinder walls.

If two compressors are being operated in parallel on the same suction line, it will still be best usually, to lead the return oil into the crankcase of one of the compressors just above the normal oil level.

If the oil equalizing arrangements have been successfully made, putting the return oil into one crankcase should not disturb the oil level equalization.

Returning the oil into the oil equalizer line would probably be satisfactory in most cases, but there seems to be little advantage over returning it directly to the crankcase.

There is apparently no reason to return the oil into the suction line or suction manifold, and there are very good reasons not to. Certainly, the oil should never be returned into the gas equalizer line. The presence of oil in the gas equalizer line would cause a difference of pressure between the crankcase and allow one compressor to rob the other of oil.

SELECTION OF OIL SEPARATOR

There are several factors, such as evaporator temperature, head pressure variation in load, variation in ambient temperature, etc., that might affect the selection of the oil separator as to size.

Selection on a horsepower or B.t.u. per hour basis is not necessarily very accurate, but is probably as practical as any other way. At any rate, the instructions of the manufacturer of the oil separator are the most accurate and trustworthy of any available, and should be followed.

If, however, the job seems to present some unusual and special problems, write to the manufacturer of the oil separator, and possibly to the manufacturer of the compressor, also. Give them all of the data on what the special difficulties are. They should be able to help you better than anyone else.

Southwestern Producing Helical Crimped Tubing

MUSKOGEE, Okla.—Southwestern Finned Tube Corp. is now ready to produce helically wrapped crimped fin tubing at its new plant here, Hugh A. Kerr, president, has announced.

Kerr, who has many years' experience in the finned tube business, says the firm can supply proper surface for all phases of heating, cooling, and heat exchanger applications.

Facilities are also available for shipment from an eastern plant if necessary or desirable.

TOP SECRET REVEALED!

The closely guarded secret of how hundreds of refrigerator and air conditioning service and repair men find the extra time to take on more jobs—take home a bigger pay envelope, has been revealed. It's Frankell's Hermetic Compressor Opener—a fully proven, precision engineered unit that requires only 2 minutes of a man's time to open any shape compressor (up to 20" in dia.)—regardless of the position of the weld. It's easy as A,B,C,— anyone can do it... no special fixtures or jigs required... and just one hermetic job a week pays for this time saving, money making wonder. Remember, when you repair a hermetic compressor—the profits are big.

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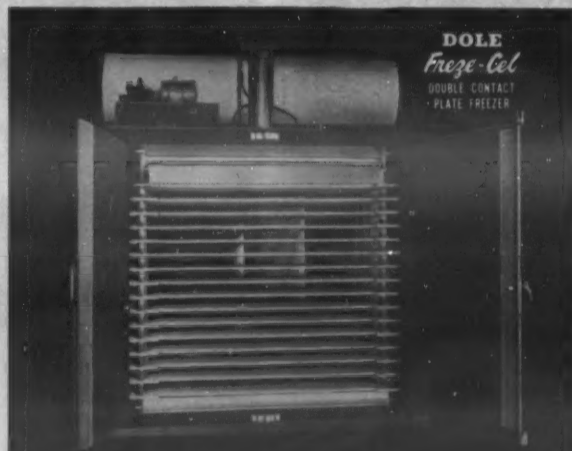
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* WHAT PRODUCTS DO THEY BUY?

In addition to air conditioning units and their usual accessories, such as condensers, cooling towers, coils, refrigerants, and motors, engineered air conditioning systems for large buildings, factories, etc. require such items as ducts and duct materials . . . controls . . . piping . . . insulation . . . air moving equipment . . . air cleaning and washing systems . . . pumps . . . diffusers and grilles . . . boilers . . . heat exchangers . . . furnaces . . . dehumidifiers . . . humidifiers . . . vibration eliminators.

WHAT DO THEY READ?

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Air Distribution Requirements In Year-Round Air Conditioning

Part 3—Fundamentals of Equipment

By Frank D. Klein, Chief Engineer, Governair Corp.

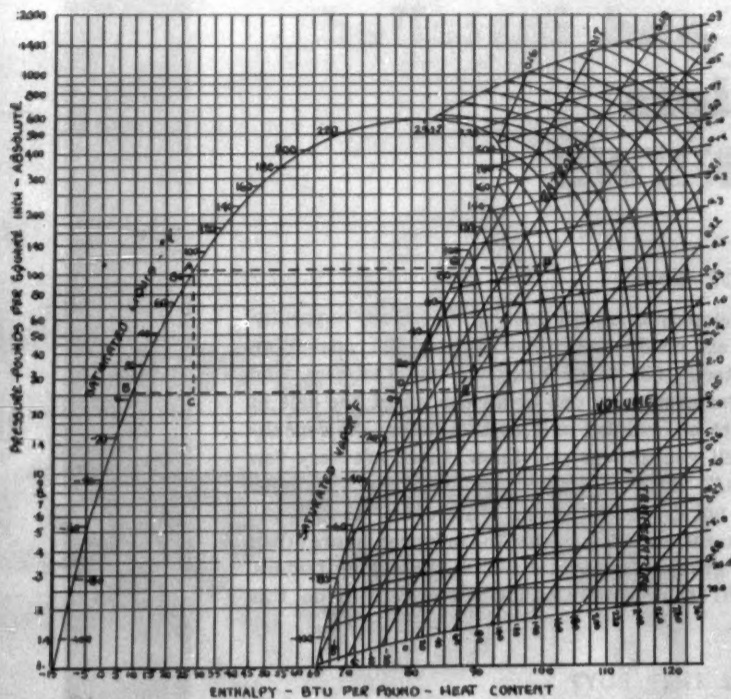


FIG. 49—Typical Mollier Diagram for Refrigerant-12.

Because most of us have been "friends" with Refrigerant-12 longer than Refrigerant-22 the following remarks are based on that refrigerant.

The three methods for heat dissipation, of those heats discussed, are (1) Suction Gas Cooling of the cylinder walls (and other parts in hermetics), (2) Water Cooled Heads, and (3) Additive methods for air-stream cooling external to the compressor itself such as fan-type flywheels and auxiliary fan or blower equipment directing their air stream over the casting or body of the compressor.

However, cooling or dissipation of the heat external to the compressor in the majority of

cases is dependent on the temperature of the surrounding atmosphere; as a result the surrounding atmosphere must be of such a temperature to be lower than that of the total heat to be dissipated. This atmospheric temperature is of course equally important in dissipating the heat of electric motors which might be driving the compressor when applied external to the compressor.

The properties of the atmosphere, the air, surrounding the working compressor then must be of such nature as to aid and abet transfer, acting as the transfer media. A look at the typical properties of saturated air and the rate of heat absorp-

Properties of Saturated Air and Rate of Heat Absorption Under Varying Temperatures

Air Temperature °F.	Weight of Vapor Per Cu. Ft. In Lbs.	B.t.u. Absorbed Per Cu. Ft. of Air Per °F.	Cu. Ft. of Air Raised 1° F. by 1 B.t.u.
0	.000069	.02002	48.04
10	.000111	.02039	49.05
20	.000177	.01998	50.05
30	.000276	.01955	51.15
40	.000409	.01921	52.06
50	.000587	.01883	53.11
60	.000829	.01852	54.00
70	.001152	.01811	55.22
80	.001576	.01788	55.93
90	.002132	.01763	56.72
100	.002848	.01737	57.57
110	.003763	.01716	58.27
120	.004914	.01696	58.96
130	.006357	.01681	59.50

tion is given in the chart.

At this point one can see the limits involved in the use of atmosphere alone as a transfer media; such limits cannot be expanded to meet the requirements of excessive heats of operation.

A detailed look at the Heats generated, requiring dissipation, and the effect of atmospheric temperatures may be illustrated in the following example of a "40-ton" open-type compressor, with refrigerant-cooled cylinder walls, operating on Refrigerant-12.

It was emphasized at the beginning of this part of this series, that to understand the "heart" of the refrigeration system, it was necessary to understand refrigerants. At this point, and before we can analyze this problem, we must understand the "work" done on this refrigerant by the compressor involved, and here we become involved in the understanding of the Mollier Diagram, for it is the most common tool to the initiated compressor design en-

gineer as well as applicator and serviceman.

WHY THE MOLLIER DIAGRAM AT THIS POINT?

We wish to understand in this problem the effects of the Total Heat of Compression to be dissipated, with the accompanying mean wall temperature of the cylinder that will be imparted to the compressor head and body that will ultimately have to be dissipated by a surrounding atmospheric temperature.

While the values of the refrigerant may be obtained from the Saturated and Superheat tables, a Mollier Diagram for Refrigerant-12 with its revealing curves offer a much more understandable picture, visually, of what happens, for they reveal Heat Content, Volume, and its reciprocal Density, by calculation, pressure, temperature, and Entropy.

The late Paul Reed, who wrote so prolifically for the industry, included as a part of one of his series detailed instructions on "How To Use the Mol-

lier Chart." It is from this article I reproduce in Fig. 49 the Typical Mollier Diagram for Refrigerant-12. Similar diagrams for Refrigerant-22 are available. Refer to this figure and chart in the following discussion.

1. From Fig. 49 let:

"A" equal the temperature and pressure at the Expansion Valve.

"B" equal the temperature and pressure entering the Evaporator.

"C" equal the temperature and pressure at Suction in the Compressor.

"D" equal the temperature and pressure at Discharge leaving the Compressor.

2. Next, assume the conditions of: 35° Suction Temperature, 115° Condensing Temperature, and 65° Gas entering the compressor.

3. Determine the B.t.u. per Pound of Refrigerant Circulated:

Refer to Fig. 49 and we find that:

"C" equals 86.54 B.t.u. per pound being circulated.

"D" equals 96.70 B.t.u. per pound being circulated.

Thus: 96.70 minus 86.54 equals 10.16 B.t.u. per pound circulated.

4. Determine the Number of Pounds of Refrigerant Circulated Per Ton:

Assume, 53.0 B.t.u. per pound of refrigerant circulated in the Evaporator (based as Latent Heat of Vaporization) and 200 B.t.u. per minute per ton.

Thus: 200 divided by 53.0 is equivalent to 3.78 pounds of refrigerant per minute/per ton circulated.

5. Determine the Total Heat of Compression Per Ton:

10.16 x 3.78 is equivalent then to 38.4 B.t.u. per minute per ton of Net Refrigerating Effect.

Thus in allocating this information to the so-called 40-ton compressor in our example, what is the EFFECT?

Assume, of course, that the Total Heat Load is 480,000 B.t.u. or 40 Tons.

Thus: 40 x 38.4 is equivalent to 1,540 B.t.u. per minute involved in the Total Heat of Compression, which then must be dissipated.

(To Be Continued)

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Elgen Mfg. Moves To Larger Quarters

LONG ISLAND CITY, N. Y.—Elgen Mfg. Corp., formerly of 41-34 39th St. here, has announced the leasing of a building at 39-42 Gale Ave., also in Long Island City.

The move has been necessitated by the rapid expansion of the company into more and more allied lines in the sheet metal industry, it was stated. At present Elgen manufactures such products for the heating, air conditioning, and ventilating field as flexible duct connectors, louver and vane runners, damper hardware, duct tapes, and insulation adhesives.

The management said the new location is over four times the size of the former plant. Besides the ample manufacturing facilities, the building offers extensive storage, shipping space, and experimental-research work areas.

Unitary Equipment Certification--

(Concluded from Page 1, Col. 5) variety of brand names to offer the public, all certified as complying with ARI Standard 210-58, it was stated.

Also, builders and contractors may take advantage of the nationwide promotion program that is planned to make the unitary certification seal nationally known as a guarantee of performance, Lytton pointed out.

The program, which becomes effective Jan. 1, covers thousands of residential and commercial type air conditioners of less than 135,000 B.t.u.h. cooling capacity.

Under contracts signed with ARI, each participating manufacturer agrees to produce, test, and rate these units in accordance with the ARI Standard, and to supply the test data to ARI. On acceptance by ARI of this test data, the producer is given the right to use the certificate and seal.

Data Will Be Made Available To Public

The institute will then include this information in a "directory," which will be made available to the trade, to competitors, to the government, and to the public.

In addition, the contracting manufacturers agree to "random" testing of their certified products by a laboratory under contract to the institute. This means that ARI may at any time go to a distributor's warehouse, ask for a unit by model number, take it to the laboratory for testing, and advise its manufacturer of the test results.

If they are not up to advertised claims, the manufacturer will be told that he must bring the unit into conformance or forfeit the right to use the seal.

Each piece of certified equipment will bear the seal of certification, either as a part of its nameplate or attached to the unit as a decalcomania.

Firms Urged To Check On Competitors' Line

"Under another phase of the program, participating manufacturers are urged to test the certified products of their competitors and report results of these tests to ARI," the announcement said. "If a competitive test indicates that the unit does not meet advertised capacity or other claims, ARI will procure a unit of the same model number and have it tested by the testing laboratory."

"Outcome of these tests, like the random tests, could result in withdrawal of the right to use the seal if it shows that the unit fails to meet the advertised performance and if its manufacturer does not make the changes necessary to accomplish this compliance."

"Similarly, complaints from other sources—individual users, government purchasers, and others—will be cause for testing of the unit against which non-compliance is charged."

At the same time, the Unitary Section of ARI has authorized a national publicity campaign designed to acquaint the public as well as the retail and wholesale marketers of the industry with the meaning of the seal.

This promotional program is

being planned by a three-man committee from the section, and in all likelihood will include all, or nearly all, media available.

The first "directory" of certified equipment (including central residential units, self-contained air conditioners such as those used in commercial installations, and other combinations designed as units, but not room units or anything larger than 135,000 B.t.u.h. in capacity) will be prepared by ARI for distribution throughout the industry, at all levels, about Jan. 1.

Monthly Supplements Will Cover Changes

Monthly supplements will be issued as companies not now participating sign contracts to enter the program, and changes are made in models.

These directories, with supplements, will be supplied to all dealers, distributors, and others handling "certified" equipment, to be used as a sales tool and also as a guide in the installation of certified units, particularly remote systems, in which coils must be balanced with the condensing unit so that performance will be in compliance with the standard.

In the case of split systems, types, designs, and capacity of coils will be specified for each type of certified condensing unit listed in the directory.

Copies of the directory of certified units, which will list their ratings and other characteristics, likewise will be distributed to all government officials—Federal, state, and local—whose duties involve specifying and purchasing air conditioning equipment for government use.

Another part of the promotional program probably will involve the use of posters, displays, and other "props" of a uniform nature, which will enable distributors and dealers in a given area to make simultaneous display and promotion of the seal and the certification program which it represents.

A small pocket-size booklet, designed to inform the public of the benefits of air conditioning generally and of ARI-certified equipment in particular, and containing all basic information about the certification program, will be issued in quantity, so that dealers and distributors may use it as a mailing piece.

Promotion Group To Meet on Dec. 9

Members of the promotion committee will hold their first meeting on Dec. 9 in Washington to make detailed plans for the promotional program.

The committee is headed by A. F. Ward of Worthington Corp., formerly chairman of the Unitary Air-Conditioner Section, and includes in its membership Sydney Anderson, Jr., Airtemp Div., Chrysler Corp., and James F. Brownell, Rheem Mfg. Co. Lytton, chairman of the section, is with Lennox Industries, Inc.

Among the promotional and publicity areas to be explored by the committee are the possibilities of a film for television use, purchase of space in trade and other publications to impress upon the public—and the trade—the value of the seal.

Firms Giving Up on Irradiated Foods-- Merger Voting--

(Concluded from Page 1, Col. 3) covered, however, that many foods, when subjected to irradiation, underwent a change in color, texture, odor, and flavor, he noted.

These drawbacks, the general said, are being solved by taking each food item, studying its peculiarities, and developing the amount and type of irradiation needed to preserve it without impairing its palatability.

Army Claims Answers For Several Foods

Asserting that the Army already has found the answer for several kinds of foods, Gen. McNamara said he saw no reason why, eventually, it could not find the answer for nearly all types.

Both the refrigeration and canning industries were actively participating in the program, according to the general. He said radiation preservation of foods depends upon the item being packaged to prevent recontamination.

The process did not eliminate the need for refrigeration of nearly all fresh fruit and vegetables to keep them crisp, he stated.

Gen. McNamara pointed out that the Quartermaster Corps is building an ionizing radiation center at the Sharpe General Depot, Lathrop, Calif., to study costs and other aspects of potential commercial production.

He predicted that irradiation would permit substantial savings in weight and bulk and a greater variety in foods to troops, in addition to savings

in logistical effort and in manpower. He added that availability of vast stores of irradiated foods "could be a veritable god-send" in case of a national emergency.

The food companies reported at the GMA meeting as having abandoned or reduced irradiation experiments after extensive research are Swift & Co., Campbell Soup Co., Thomas J. Lipton, Inc., Minute Maid Corp., and National Biscuit Co.

Harold E. Wilson, vice president of Swift, disclosed that his company just recently discontinued experiments because scientists "haven't found out yet how to keep (irradiated meat) from smelling" strong.

He also stated that the discoloration problem is yet to be solved after Swift's 10 years of research and the spending of several hundred thousand dollars.

The General Can Say: 'Eat It!'

Wilson commented: "The general has a captive audience. He can just say, 'Eat it.' But it won't sell."

W. B. Murphy, president of Campbell Soup, said he thinks food manufacturers "are keeping a completely open mind on the subject, but they'll have to be shown. Right now we don't see a glimmer for most foods."

Commenting later on the executives' remarks, Gen. McNamara said the food industry's support of a test operation at Sharpe General Depot is a better indication of its general attitude.

(Concluded from Page 1, Col. 5) have made special efforts to get the memberships to vote on the proposal, so that the result will reflect the feeling of a true majority of the membership.

It is certain that most of the balloting will be done by proxy. Ballot squares are provided by which the member can indicate whether he casts his vote in favor or against the merger. However, in both societies, if the proxy envelope is signed, but no marking is made on the ballot, the vote will be cast for the proposal.

(In the Nov. 17 issue of the News it was stated that ASHAE ballots which did not have the member's signature upon the ballot proper would be counted, but not recorded. ASHAE has advised the News that all ballots will be recorded.)

Hydronic Heating Drive Boosts Sales--

(Concluded from Page 1, Col. 2) Nov. 17-18.

Local councils in Chicago, Cleveland, and Milwaukee, working in cooperation with the national organization, have developed concerted sales drives that seem to be paying off in increased sales, indicated John H. White, national president.

Several midwest heating contractors have increased their hydronic heating work more than 500%, according to White.

"These advances are particularly encouraging to the industry since other forms of heating have controlled 95% of the market in these areas in recent years," White said.

Concentrating its efforts on residential heating, the Better Heating-Cooling Council has admittedly not done much yet in the residential cooling field, nor has it yet given much consideration to commercial and industrial fields, it was brought out. The group's activities will be broadened, it was intimated.

In 1959, besides continuing its work in the residential field, BHC will have two programs of promotion in the commercial and industrial fields and in distribution.

Large buildings—traditionally markets for hot water and steam heating—are inviting increasing competition from warm air and electric heating, admitted BHC at its meeting, so the group plans action to reverse this trend.

The other new program is

aimed at helping wholesalers increase their hydronics business and profits through closer cooperation with BHC and its members, according to Marvin Mitchell of Weil-McLain, chairman of the BHC plans board.

First step in the plan, now in progress, is a survey to determine what promotional aids and assistance wholesalers want and need to help them increase their hydronics business.

The plan also calls for a full-time specialist to help wholesalers promote hydronics sales.

Dr. Oldach--

(Concluded from Page 1, Col. 4) who has elected to retire early next year.

The appointments are effective Dec. 1. At company request, Newman has agreed to remain as special assistant to the general management of the Organic Chemicals Dept. until the end of February.

Dr. Oldach, who is 44, joined the company in 1940 as a senior chemical engineer. After serving in various capacities, he was appointed assistant director of the Development Dept. in 1955.

Dr. Oldach was graduated from Yale university in 1937 with the degree of bachelor of science in chemical engineering. Three years later he received a doctor of science degree in chemical engineering from Massachusetts Institute of Technology.

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You Asked About It

From the many requests for information it receives, the News will select and publish some of general interest. In many instances, the answers will be supplied by authorities in the industry.

Q. We have installed several makes of window air conditioners in our hospital. We have a major problem in winter with cold drafts from the units in spite of the usual caulking and sealing precautions. The problem becomes acute when the temperature drops below 20° F. Outside covers have proved only a partial answer. Are the manufacturers aware of this problem, and are they doing anything about it?

V.F.G.—Boston

A. M. V. Griffin, Unitary Equipment Div., Carrier Corp., explains that the principal difficulty comes as a result of an effect well known in heating.

"Room air strikes a cold window—in this case a window unit—to become chilled. It then drops to the floor to cause cold drafts.

"Since a room air conditioner is partly outside the window, it will become quite cold, and the room air strikes

the exposed metal parts inside the window. This is somewhat of a radiator in reverse.

"Even where units are flush mounted with only a plastic grille in the room, some air can circulate through the grille to be cooled by the outside metal parts.

"This can be eliminated by blocking the grille openings in the winter time with canvas or paper and masking tape.

"If heating outlets can be directed to blanket the window and air conditioner, this would be another solution.

"The hospital should be able to minimize cold drafts if they can mount their units as far out the window as possible. If the type of units they installed have metal grilles or cold metal surfaces exposed to room air, they might consider some sort of internal cover. This would probably be more effective in stopping drafts than an outside cover."

FIELD SERVICE ENGINEER

required by

HUSSMANN

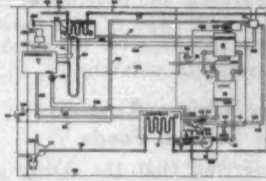
Outstanding opportunity for a capable, experienced, refrigeration service man, under 40 years, to handle Field Service Engineer's responsibilities in limited territory. Must be free to travel. Food Store experienced preferred. Willing to move at our expense, if necessary. High School (or better) education. Give full details, with five references, and send photograph with first letter. Applications without photographs will not be considered. Salary, expenses, insurance, welfare, and other benefits.

Write John H. Spence, Service Manager, HUSSMANN REFRIGERATOR CO., 2401 North Leffingwell Avenue, St. Louis 6, Missouri. Replies held confidential.

PATENTS

Week of Sept. 2
(Concluded)

2,850,368. CONTROL SYSTEM FOR AN ABSORPTION REFRIGERATION SYSTEM. Richard M. Merrick, East Syracuse, and Everett P. Palmatier, Solvay, N. Y., assignors to Carrier Corp., Syracuse, N. Y.



1. Air conditioning apparatus comprising an absorption refrigeration system including an absorber, a generator, means for transmitting a solution of refrigerant and an absorbent from the absorber to the generator, means associated with the generator for heating the solution within the generator to cause a portion of the refrigerant to be separated from the solution. . . .

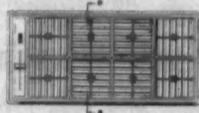
2,850,268. REFRIGERATOR-TYPE ICE CREAM FREEZER. William S. Miller and Frank T. Borkowsky, Ottawa, Ill., assignors, by mesne assignments, to said Miller.



1. In a freezing device comprising a freezing tray, a removable drive casing adapted to be secured over said tray, and depending from said casing a rotatable scraper having a central shaft bifurcated at its upper end, the combination of a hollow drive shaft rotatably mounted within said casing and having one open end extending through the bottom of said casing. . . .

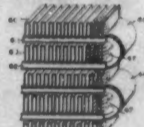
DESIGN

183,446. FRONT PANEL FOR A ROOM AIR CONDITIONER OR SIMILAR ARTICLE. Richard W. Brookins, Long Beach, Calif., assignor to Eschig Mfg. Co., Los Angeles.



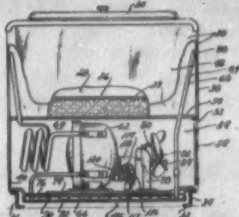
Week of Sept. 9

2,850,793. METHOD OF MAKING REFRIGERATING APPARATUS. Edmund F. Schweller and Charles C. Whistler, Jr., Dayton, Ohio, assignors to General Motors Corp.



The method of forming a multiple pass heat exchanger having integrally formed return bends therein which comprises forming longitudinally extending grooves adjacent the edges of a strip of flat stock and then folding the strip along its center line, bonding the edges together to form a flat conduit. . . .

2,850,833. REFRIGERATING APPARATUS. Lawrence A. Philipp, Detroit, Mich., assignor to American Motors Corp., Detroit, Mich.

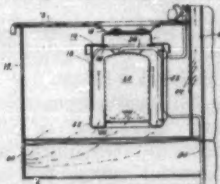


Refrigerating apparatus comprising a cabinet having a food storage compartment and a second compartment having an open bottom and an open side, refrigerating means for said food storage compartment including an evaporator, a motor-compressor unit, a condenser connected to said motor-compressor unit. . . .

2,850,804. REFRIGERATING APPARATUS. James W. Jacobs, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich.

4. In combination, a one-piece plate type heat exchanger having formed therein a condenser passage, an eva-

porator passage, and a water passage; a refrigerant compressor; means for connecting said compressor, condenser



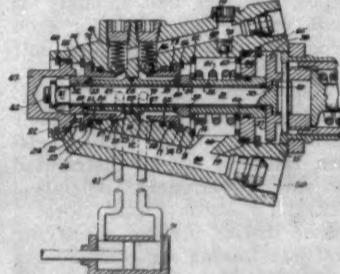
passage, and evaporator passage in series refrigerant flow relationship. . . .

2,850,959. PERIMETER AIR BLEND. ER. Norman Burlin Watkins, Wichita, Kan., assignor to The Coleman Co., Inc., Wichita, Kan.



1. A perimeter air mixer cabinet, comprising a relatively long outer casing having an inlet for room air near its bottom, a nozzle casing mounted within said outer casing and having centrally a port for the admission of conditioned air. . . .

2,851,012. CLOSED CENTER VALVE WITH BALL CHECK VALVES. Oscar H. Banker, Evanston, Ill., assignor to New Products Corp., Skokie, Ill.



1. A valve comprising a valve body having substantially longitudinally disposed inlet and vent passages and a bore, a control member reciprocable in the bore and dividing the bore into two chambers. . . .

2,851,013. FLUID MOTOR WITH FLUID ACTUATED REVERSING VALVE. George E. Doughton, Durham, N. C.

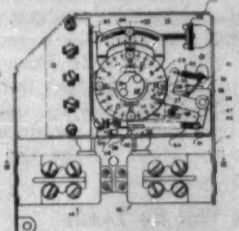


1. A fluid operated motor comprising: a cylinder having an inlet port at one end for introduction of a pressure fluid, a piston reciprocable in the cylinder, a hollow spool member supporting said piston, said spool member having a series of selectively spaced ports communicating with the interior of the spool member, a spool valve having an axial vent core to vent the fluid from the cylinder through the spool member ports. . . .

Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

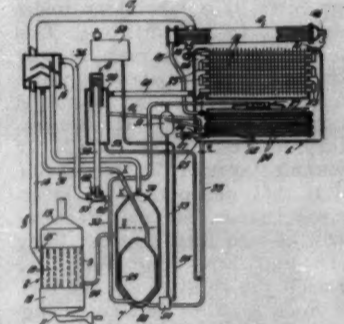
Printed copies of patents, reissued patents, and patent designs may be secured from the Patent Office; patents and reissues are 25¢ each, while designs are furnished at 10¢ each. Address orders to: Commissioner of Patents, Washington 25, D. C.

2,851,100. DEFROST CONTROL. Arthur L. Good, Elkhart, Ind., assignor to Penn Controls, Inc., Goshen, Ind.



10. A time switch mechanism of the type in which an electrical control means is operated by an actuated member comprising: a central mounting panel having a front face and a rear face, timing means including a camming member driven at a uniform speed in a circular path whose plane overlies the front face of said panel. . . .

2,851,255. AIR CONDITIONING. Philip F. Anderson, Jr., Evansville, Ind., assignor, by mesne assignments, to Arkia Air Conditioning Corp.



1. A heat operated apparatus for either heating or cooling comprising: a generator in which vapor of a volatile liquid is expelled from absorption solution by the application of heat; a liquefier; a heat exchanger element adapted to operate as either a refrigerant evaporator for absorbing heat from its surroundings, or as a heating element for giving up heat to its surroundings; an absorber; conduit means connecting the generator, liquefier and heat exchanger element to provide a refrigerant circuit of an absorption refrigeration system. . . .

(To Be Continued)

CLASSIFIED ADVERTISING

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POSITIONS WANTED

SERVICE MAN with ten years' experience in all phases of commercial refrigeration, air conditioning, major appliance service and electrical trouble shooting. Desire position with super-market chain or progressive service organization. Residing in Southern New England. Will relocate under proper conditions. Age 30, married. For full information write: BOX A6141, Air Conditioning & Refrigeration News.

POSITIONS AVAILABLE

MANUFACTURERS' AGENTS wanted to set up dealers for residential central heating and air conditioning equipment. Complete line, competitively priced. Call or write MIAMI PRODUCTS, INC., P. O. Box 1029, Miami, Oklahoma. Attn: David D. Ray.

EQUIPMENT WANTED

USED AND obsolete refrigeration compressors, condensing units, valve plates and parts for York, G. E., Par, Mills,

Brunner, Carrier, Universal, and others. Furnish full description as to model number, horsepower, etc. **UNITED REFRIGERATION CORPORATION**, 514 W. 12th Street, Los Angeles 15, California.

EQUIPMENT FOR SALE

MODEL HH 2 h.p. automobile air conditioning compressors tapered shaft, vertical mount, complete with flywheel \$33.95. Send for free circulars and catalogs on money saving refrigeration & air conditioning parts and supplies. **WALTER W. STARR**, 2833 Lincoln Ave., Chicago 13, Illinois.

THERMOSTATIC EXPANSION VALVES—Freon 12—adjustable—10° superheat—1/4 x 1/2 fl. inlet, 1/2 fl. outlet. All temperature application, 1 year warranty, satisfaction or money refunded. Introductory offer—1/2 ton—\$26, 1 ton—\$75. COD or check with order. **BOX A6139**, Air Conditioning & Refrigeration News.

NEW B & G pumps—Series 1522, 6—1/2 h.p. 208/220/3, 3—1/2 h.p. 115/60/1, 1—1/2 h.p. 115/60/1. Below cost—In original cartons. Write **BOX A6142**, Air Conditioning & Refrigeration News.

BUSINESS OPPORTUNITIES

FOR SALE: Good service business. Only one in area. Lots of work, but doctors ordered me out. Both commercial and household servicing. **GENERAL REFRIGERATION SERVICE**, T. L. Brandon, 615 E. Lincoln, Las Vegas, N. M., Ph. 4-8612.

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AIR CONDITIONING COMPANY, INC. (SOUTHERN CALIFORNIA)
6265 SAN FERNANDO ROAD, GLENDALE 1, CALIFORNIA

Servicing Automobile Air Conditioners

(Vol. 3)

BY C. DALE MERICLE

This is another in the new series of articles on automobile air conditioners which has been prepared to enable the experienced refrigeration serviceman to cash in on this rapidly growing market.

New makes not previously discussed will be described in detail. Most of the series, however, will be devoted to 1958 models of the many makes of units that have already been discussed in the earlier articles. Data on these 1958 models will be limited to the changes made over preceding models.

It will be advisable, therefore, to refer to the previous articles, which are also now available in two handy manuals—Vols. 1 and 2 "Servicing Automobile Air Conditioners."

the system in order to make repairs.

Although the compressor of the system can be used for evacuating, better results, especially for moisture removal, are usually obtained by the use of a separate vacuum pump.

Charging

After evacuation and leak testing, the system should be charged through the low side with refrigerant in the vapor state.

Maximum charge is $2\frac{1}{4}$ lbs. of Refrigerant-12.

Trouble Chart

Service complaints and diagnosis common to all under-dash automobile air conditioners employing a thermostatically controlled magnetic clutch will apply to the Cartrol-Aire units.

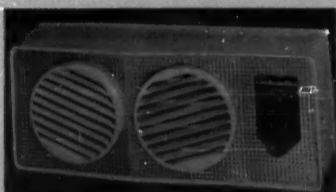


FIG. 1—Evaporator assembly of 1958 under-dash Cartrol-Aire unit. Note thermostat and blower control at right.

CARTROL-AIRE

Cartrol Corp.
3125 Wyandotte St.
Kansas City, Mo.

"Cartrol-Aire" automobile air conditioners produced in 1957 and 1958 were under-dash systems. The 1957 unit was designated as Model CACTX; the 1958 unit is Model CAC58.

This make follows the conventional arrangement of having the condenser located in front of the car radiator, the compressor mounted on the engine and driven through a magnetic clutch, and the evaporator case (Fig. 1) attached beneath the car dash.

Temperature control is accomplished by an adjustable thermostat which cycles the magnetic clutch and thus the compressor, and a three-speed blower control.

Refrigerant-12 is used in Cartrol-Aire systems.

Compressor

Compressor of the Cartrol-Aire air conditioner is mounted on the car engine and is driven through a Warner magnetic clutch.

Condenser

Condenser is mounted in front of the radiator of the car.

A drier and sight glass are installed in the liquid line, normally in the engine compartment.

Evaporator

Evaporator case is attached beneath the dash. This assembly consists of the evaporator coil, thermostatic expansion valve, blower and clutch controls, and air outlets.

Two adjustable round air outlets are provided on the front of the case.

Controls

Temperature control of the Cartrol-Aire is achieved by a combination of blower control and an adjustable thermostat which cycles the magnetic clutch.

These controls are located on the front of the evaporator case to the right.

Blower control provides for three speeds and also has an "off" position.

SERVICE HINTS

Evacuating

The Cartrol-Aire system should be evacuated following initial installation or opening of

Does Your Appliance Carry This

Seal of
Quality?

THE MOTOR USED IN
THIS EQUIPMENT IS PROTECTED
AGAINST OVERLOADS, LOW VOLTAGE,
OVER-VOLTAGE WITH A
MIGHTY MITE
THERMAL PROTECTOR

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WRITE FOR FREE COLOR BROCHURE
OR SEE YOUR TRAVEL AGENT
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WHAT... WHEN... WHERE

American Society of Refrigerating Engineers Meeting
Dec. 1-3, Roosevelt hotel, New Orleans.

National Heating & Air Conditioning Wholesalers Convention
Dec. 1-3, Statler hotel, Cleveland.

National Warm Air Heating & Air Conditioning Association Convention
Dec. 4-5, Statler Hilton, Cleveland.

Institute of Appliance Manufacturers Meeting
Dec. 7-9, Statler-Hilton hotel, Dallas.

Dairy Industries Exposition
Dec. 8-13, Navy Pier, Chicago.

National Association of Home Builders Exposition
Jan. 18-22, Chicago.

Industrial Heating Equipment Association Meeting
Jan. 19-20, Cleveland.

International Heating & Air Conditioning Exposition
Jan. 26-29, Convention Hall, Philadelphia.

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1. "Selling for Profit"

by Frank Klein, Marketing Consultant—26 pages, $8\frac{1}{2}$ x 11 size, highlighting the fundamentals of selling air conditioning which even some veteran salesmen tend to forget—"The Health Factor," Motivating the Commercial Buyer, The Importance of Humidity Control, Developing a Sales Approach on the basis of need, answering objections, competitive products, Dramatization and Demonstration—in short, a complete sales book that tells you where and how to concentrate your selling effort and HOW TO MAKE IT PAY OFF. Only \$1.00 per copy.

2. "Service Maintenance Contracts and Average Charges for Service Parts and Operations"

by George M. Hanning, Staff Editor. Twelve pages, $8\frac{1}{2}$ x 11 size, complete run-down and explanation of four types of basic service contracts. Explanations of exact detail and wording for your service contract agreement along with specific illustrations of charges for various labor items, percentage mark-up on parts, and yearly maintenance charges for various size systems. A must for service companies or companies with service departments. Only 50¢ per copy.

3. "Operating Costs of Residential Air Conditioning"

by R. A. Gonzalez, Director of Technical Service, Airtemp Division, Chrysler Corporation. Four pages, $8\frac{1}{2}$ x 11 size. Case histories of three groups of houses, complete with types of residential air conditioning installed,—controlled tests of additional kilowatt hours consumed in the operation of air conditioning complete with interpretation, significant conclusions and selling points when your prospect asks "How much will it cost me to operate," only 25¢ each.

4. "Comparison of Refrigerants 12-22"

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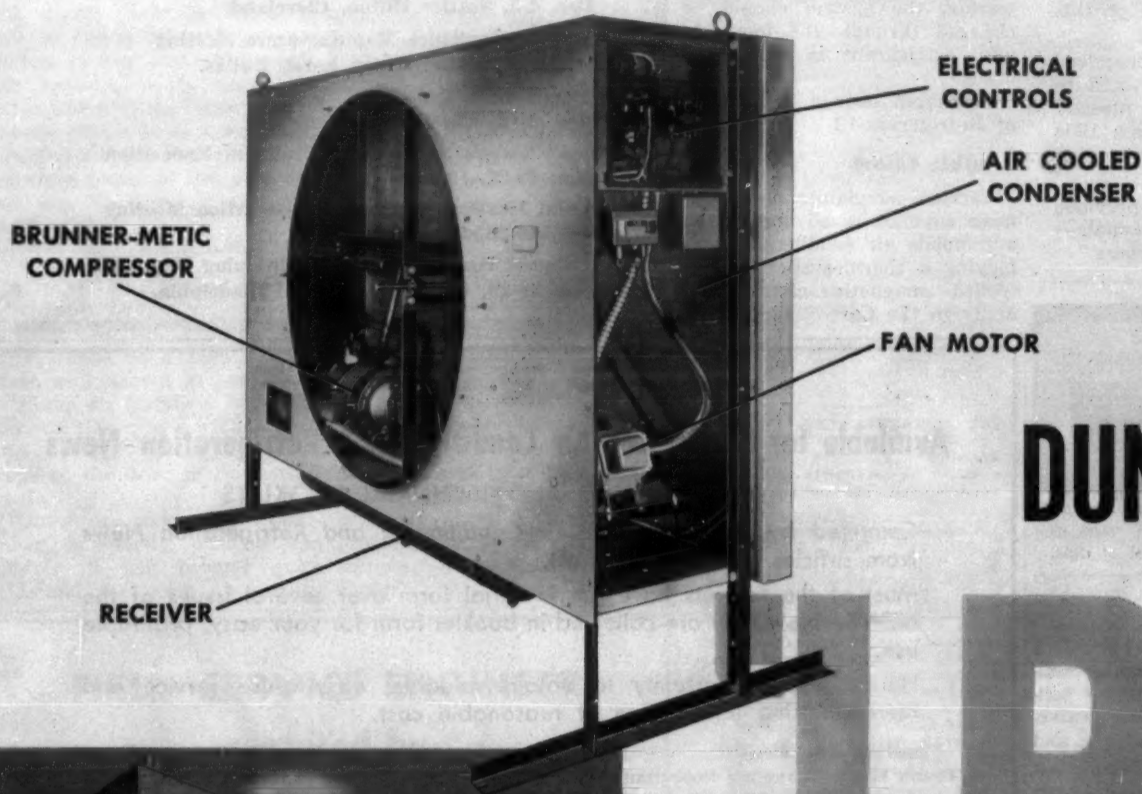
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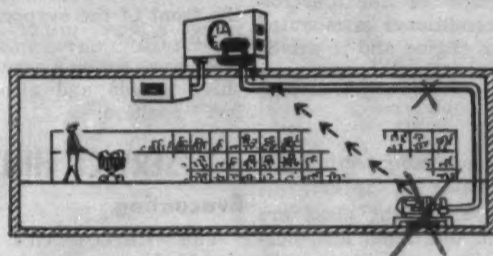


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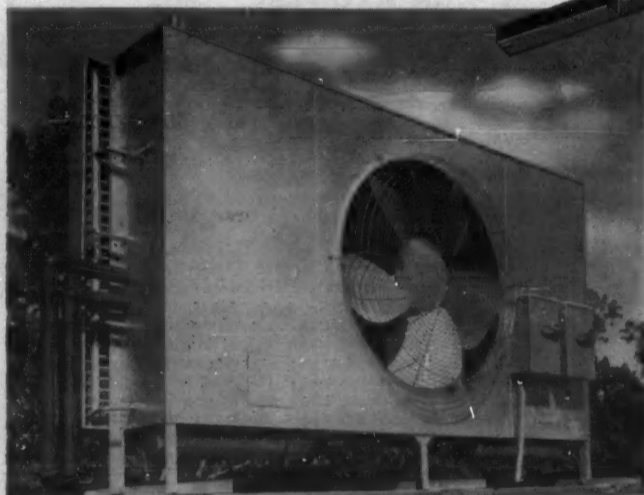
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